Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME VII.] NEW-YORK, JANUARY 31, 1852. [NUMBER 20.

THE
Scientific American,
CIRCULATION 16,000.
PUBLISHED WEEKLY
At 128 Fulton street, N. Y., (Sun Buildings),
BY MUNN & COMPANY.

Hotchkiss & Co., Boston.
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Stokes & Bro., Philadelphia.
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RAIL-ROAD NEWS.

What Railroads Do.

The Galena and Chicago Railroad has been extended thirty-five miles west of Chicago, penetrating a region solely agricultural, and which scarcely had an inhabitant before 1835. When the building of this railroad was commenced, it was supposed that it would yield little or nothing to the stockholders, till after its completion to Galena. But the experiment of a dozen miles of finished road, says the Ill. State Register, demonstrated that the calculations of the projectors were erroneous, and every successive mile constructed has made that demonstration more complete.

"When it was extended thirty-five miles west of Chicago, it paid fourten per cent. upon the cost; and the same income has been realized constantly as the road progressed to its present western termination, which it reached this month. Calculations for a certain amount of business between this time and the opening of navigation were made, and locomotives and cars were provided in accordance with these calculations, but it is ascertained that there is a great deal more business than the road can do, and that several more locomotives could find constant employment now, and through the winter season.

We mention these facts to show that railroads create business where little existed before, and that capitalists need not object to western railroad stock, simply because the lines are located in what is generally termed a wilderness country.

What has been said of the Chicago and Galena road may be said of every projected line in this State, and we shall find, that as they progress, business sufficient to support them and pay besides a handsome income to the owners, will spring up and extend, and speedily make our glorious State the gem and bright particular star of the Union."

City Railroads.

A grant was given by our late Common Council to certain parties to construct a railroad through Sixth Avenue, and they have set themselves resolutely to work for the advancement of the project. The company is now a joint stock one, and of course it cannot be held up as a monopoly. In a few years we will have quite a number of railroads running through our city for the accommodation of citizens going to and coming from their places of business. The difficulties which have attended the crossing of the North and East rivers this winter, will make a great many leave Brooklyn and Williamsburg to reside in New York. In consequence of this, city railroads will become more necessary. Let the good work go on.

Explosions of Steam Boilers.

Two correspondents of the Syracuse Star recommend Congress to offer a reward for the best invention, to be produced in a given time, to prevent the explosion of steam boilers. The inventions are to be all tested by a competent commission at a given time and place.

MACHINE FOR MEASURING THE FLOW OF WATER.

Figure 1.

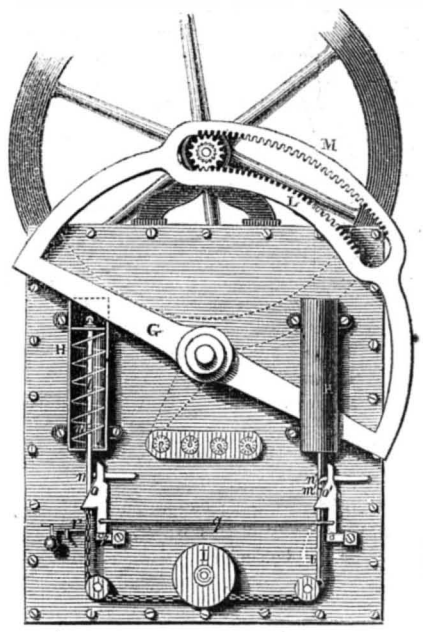
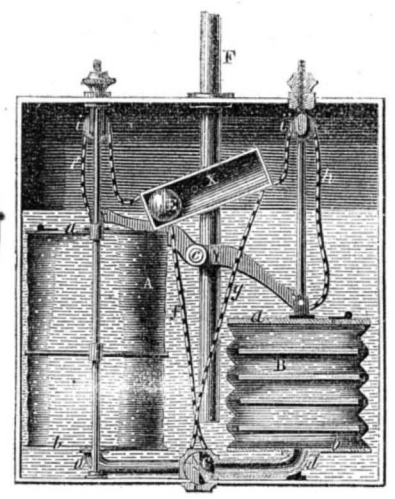


Figure 2.



This is rather a singular machine for measuring water or other fluids and deriving some mechanical power therefrom. It is the invention of Mr. Samuel Brown, an English engineer residing in Lambeth, Eng.

The improved fluid measurer is represented by figs. 1 and 2, fig. 1 representing a modification, for the purpose of obtaining motive power. Fig. 2 shows a transverse vertical section of the measuring apparatus. The measures or receptacles, into which the fluid is conveyed for measurement, consist of two flexible bags or vessels, A and B, kept distended by metal rings; these collapsible vessels are of some fluid-tight material, and capable of sustaining a considerable pressure; they are attached to discs, *a a*, and *b b*, at top and bottom, *b b*, at the lower part being fixed, while the upper discs, *a a*, are free to move. The upper discs, *a a*, have joint pins supported in brackets, and take into the forked end of a lever, Y, which oscillates on a fixed centre, *c*. The under discs, *b b*, are united with a four-way cock, C the upper passage of which forms the inlet for the water, and the under one the delivery,—the two side passages being connected by pipes, *d d*, with the vessels, A and B. In the position shown, the vessel, A, is about to deliver its contents, and the vessel, B, again be refilled. Another oscillating cylinder, X, is provided, in which a globular weight is placed, having free motion to traverse from one end to the other, on the lever, Y, being canted. This cylinder is connected at each end by two chains, *e f*, and *g h*; the chain, *e*, is attached to one end of the lever, Y, and the chain, *h*, to the other end; while the chains, *f* and *g*, communicate with a drum on the axis of the four-way cock, C, in such manner that, on either of them being subjected to tension, the one will tend to turn the plug of the cock in the opposite direction to that caused by tension on the other. The water or other fluid as it leaves A, will cause the depression of the upper disc, *a*, which, by the tension created on the chain *e*, will gradually raise that end of the cylinder, X, a little beyond the horizontal position, when the ball, E, will roll to the opposite end of that cylinder and complete the oscillation. The period having arrived when the position of the plug of the cock, C, is to be reversed, the cylinder, X, at that time completes its oscillation, when the gravity of the ball, E, overcomes the friction of the cock, C, reversing the position of the plug, so as to change the inlet and outlet passages; the water will now be allowed to escape from the full vessel, B, and enter, A, which may have been more or less emptied. The reverse oscillation of the cylinder takes place when the necessary changes are repeated, and so on; the whole is continued so long as the supply and delivery are uninterrupted; F is the supply pipe, which simply delivers the water into the outer case. The registering apparatus is actuated by the axis of the lever, Y, which has affixed to it, on the outside of the case, as seen in fig. 1, a short beam, from opposite ends of which two palls take into the teeth of a ratchet, on the first axis of the train of registering apparatus. It will be observed that the rollers, *i i*, over which the chains, *e* and *h*, pass, are supported from brackets, the stems of which pass through the cover; these are furnished with screw nuts, by which they may be elevated or depressed. By raising or lowering these rollers, the chains, *e* and *h*, will be sooner or later brought to a state of tension, and consequently produce the oscillation of the cylinder, Y, at an earlier or later period, thereby suffering a greater or less quantity of fluid to escape from the vessels, A and B, and by which it may be adjusted to the registering apparatus.

Part of the invention consists in the adaptation of the apparatus last described to the development of motion. Some of the internal parts are omitted, and others substituted, which are placed on the outside of the case, as shown in fig. 1. On the axis, *c*, a lever and segment, G, is fitted, which performs the oscillations as transmitted by the vessels, A and B. The lever, G, in oscillating, presses on a roller and piston, of which there are duplicates as represented. The piston is thereby depressed, which contracts the spring within the tube, H, and at the same time depressing the rod, *l*, until the pin, *m*, slips over a catch lever, *n*, and presses upon the incline, *o*. This incline is mounted upon a fulcrum, *p*, on which the several parts connected there will oscillate. By the contact of the pin, *m*, with the incline, *o*, that lever will be thrown backwards,—that is, towards the centre of the machine. This motion is transmitted by the rod, *q*, to a small corresponding lever, *o'*, which, therefore, performs a simultaneous movement, releasing the pin, *m'*, which it will be observed has been caught by the catch, *n'*. This pin, on being released, is thrown upwards with its rod and piston, by the expansion of the spring in the tube, H',—the lever, G, being at the time in the opposite position to that shown. The rods, *l l*, are connected by chains to a drum, I, on the four-way tap, C, which is thereby caused to perform its oscillation. The levers, *o o'*, will be brought back to the vertical position by the weighted lever, and the pin, *m*, will now be caught by the catch, *n*, and retained until a like action of the pin, *m'*, on the rod, *l'*, releases it by contact with the incline, *a'*, consequent on the alternate descent. The power to be transmitted is supposed to be from a head of water, which, according to the height of the column, will exert greater or less force on the moving discs of the vessels, A and B, which pressure, by the influx and escape of the water from those vessels, will be transmitted to the lever and segment, G. The oscillatory motion of the lever, G, is transmitted to a rotary shaft, as follows:—Two sets of teeth, L and M, are formed on the segment, which take into two pinions placed loosely on the fly-wheel shaft,—the teeth being in different planes for that object. The pinions have spring-palls attached, which take into the teeth of ratchet wheels fixed to the shaft. The teeth of these ratchets are set in opposite directions, so that while one pinion is transmitting the motion of G, to the main shaft, the other pinion is revolving on the shaft in the reverse direction, and its pall slipping backwards over the teeth of its respective ratchet wheel.

Electric Telegraph in Hospitals.

The St. George Hospital, London, has an ingenious and novel application of the Electric Telegraph. It consists of a small dial, not more than a foot in diameter, with a hand which points to certain numbers on it. They refer to a printed scale over it, on which are the names of all the physicians and surgeons of the hospital; and it is intended by means of this wonderful agency to intimate the moment they arrive, that in case of danger to any patient they may be instantly seen. On the directions are also the hours for meals, the time at which the friends of the sick must leave, the time for operations, and every other matter desirable to be known in the wards where it is thus intimated. The dial is placed in the hall of the hospital, and as the message is to be sent, so the corresponding number is found on the direction-table, and the hand is turned to a corresponding one on the dial. This causes a bell to ring in each ward, which indicates that the nurses are to refer to the dial—for they are placed throughout the establishment—when they will find the same number pointed to as the one in the hall, and by referring to the directions they at once see what the message is. This saves a vast deal of confusion in running up and down stairs, besides being more desirable for the patients, who will be exposed to much less noise. It is probable that this admirable plan will soon be adopted in all similar establishments, as well as prisons.

Counterfeit Gold Coin.

Counterfeit quarter eagles are in circulation in Savannah. The piece is described as being composed of some hard metal which has the color and ring of silver, but is easily distinguished by its glossy brightness. It has been cast in a mould, and has the milled edge. It may be easily detected by the roundness of its imprint, and the oily feeling which it has when pressed between the fingers. It purports to be of the coinage of 1847

Extraordinary Case of Mirage.

The steamship Arctic was seen in a cloud off Newport beach on Thursday last week. It was a case of mirage, as the steamship was distant about 60 miles from the place where she was seen. At that time a vapor was rising from the water.

We see it stated that a number of Americans for California, who purchased tickets from an agent of the steamer Brother Jonathan, have arrived at Panama and been refused a through passage.

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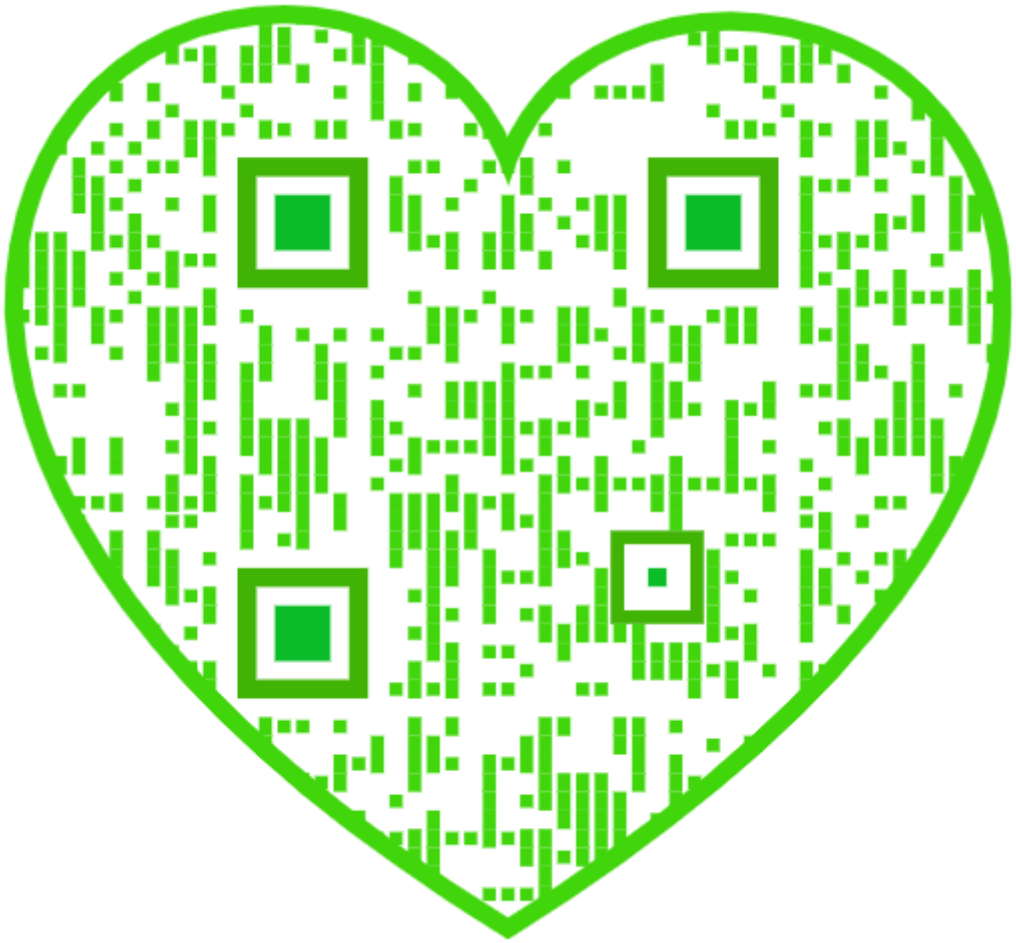

MISCELLANEOUS.

(For the Scientific American.)

Steam Carriages on Common Roads.---The Last of the Controversy.

WILLIAMSBURGH, L. I.

I have but a few words to say on this subject, and as a favor would request their insertion in the Scientific American.

Mr. Serrell, in your last week's paper, attacked me, not my communication; I neither attacked him nor any other person—I spoke of a scheme. In reference to the Report of the Committee of the House of Commons, I read it long ago, and from the very testimony adduced, I came to the conclusion—not the same as that of the Committee—that the steam carriages of Gurney, Hancock, &c., had proved to be disastrous failures. It is twenty years since that Report was made, and although the Road Commissioners of England would be very happy, since that, to see steam carriages running on the common roads, and would offer them every facility, yet the unfortunate attempts of Gurney, &c., have deterred nearly all others from following in the same line. The farmers of England have long since ceased opposition.

In 1849, Sir James Anderson got up a steam Carriage Co., something like this one in New York; it proved a disastrous failure. The most ingenious mechanics are not the most able to judge of economical schemes; this requires another faculty. Yea, more than this, all men make mistakes; it is not to their discredit, it is human nature. The San Jacinto is an evidence of the truth of this statement; I could adduce many others. Although this is the age of mechanical invention, there is a limit to the payability of every invention. Mr. Serrell, I am afraid, views the anthracite coal, like the Report of the House of Commons. If he reads the Government investigations into the qualities of coals of the United States, on page 307, he will find that coke, from its superior evaporative powers, is stated to be superior to anthracite or free burning coals, and the language of that Report, by that able chemist, Walter R. Johnson, is, "this circumstance justifies the use of coke in locomotive boilers, in preference to any other fuel, where the price does not interfere to prevent it." I happen to know something about coals and coke myself, practically, and if I knew *nothing* about steam carriages for common roads, I would not have said a word on the subject.

A plausible scheme, and one far more sensible than to run steam carriages on common plank roads, would be to make wooden rails, above six inches deep and three wide, and lay a track alongside a plank road. Mr. Ballantine, an English gentleman, who was for some time in Williamsburgh, and came here to carry out the invention of Payenizing wood, has said that he could prepare oak rails to last for a great number of years, and they would become nearly as hard as iron itself; they were to be prepared with the sulphate of copper. A railroad with wooden rails and good light locomotives, I think, would pay well, in some localities; the cost of the road would not be great. I think I have seen a notice of such a road proposed in some of the back volumes of the Scientific American. I know something about plank roads, their construction, use, &c.; I do not think a man should be stigmatized for writing an article about a scheme of any kind, as long as he uses decent language, and makes no personal remarks. ~~.

[We have received a letter from Mr. Fisher on the subject, in reply to our answer of his former letter. Mr. Serrell stated, last week, that he left us to him. Well, we do not intend to speak for speech-sake, and we say the above, from the Williamsburgh correspondent, is the last on this subject, and *it* would not be published but for two new points in it, namely, the recommendation of a wooden railroad, and the allusion to a public work on coke and coals.—ED.

American Genius.

Harrison Winans left Baltimore, a few years ago, a poor boy, but with an improved mind, acquired at a country school, with genius, ambition and enterprise. He worked his way in Russia to the head of the machinists and engineers, and became leading contractor on the great railroad between Moscow and St. Petersburgh, 400 miles long, and made over $1,000,000. On his return to Paris he married a talented, and able and beautiful lady, and will soon build a cage for her in the shape of a villa for all kinds of mechanics, and a park of three acres beautifully ornamented, where rich and poor may feast their eyes on indigenous plants and rare exotics. He goes once more to Russia to fulfill a contract with the Emperor, on public works, by which he will bring $500,000 in gold for his mental labors.

For the Scientific American.

New Magnetic Indicator.

This ingenious little instrument, contrived by a Mr. Rutter, of Bristol, England, has attracted so much attention, that the following account of the apparatus, &c., may not perhaps be uninteresting, at least to those who may not have had time to devote much attention to the study of these subjects. The New Magnetic Indicator is thus composed:—

A wooden stand is fixed to a table; from this rises a perpendicular pole, with a horizontal brass rod projecting from its summit; at the extremity of the rod there is a delicate pair of forceps, which grasps a thread of silk, the thread holding in suspension a little pendulum of sealing-wax. The bit of wax is surrounded by a glass shade, and is suspended over a small dial-plate, marked out somewhat after the manner of a compass, with the letters a, b, c, d, e, f, g, h. The operator puts his finger, or finger and thumb, upon the top of the perpendicular pole, to which the brass rod is attached, when the pendulum makes a variety of definite movements over the face of the dial plate. These movements are described as modified in an extraordinary manner by the sex of the operator, the substances held in his hand, and a variety of other circumstances. But we must refer to the inventor himself for an account of his wonderful machines. Mr. Rutter tells us that "by means of this instrument, he is not only able to demonstrate the influence of the minutest portion of matter upon the living orgasm, but likewise the polarization of our bodies, and those parts where the north and south poles are situated." "He is also able to demonstrate most clearly the difference between the male and female currents; and that the latter are generally inverse, or antagonistic to those of man." "If a person of the female sex merely breathe upon the hand of the operator, it immediately changes the current to the female. If a hair of a female is placed on the hand of the operator, or the hand of the last of any number of men in contact with him, the female current is immediately produced. The same phenomenon is produced by a pocket-handkerchief worn by a lady.

Drs. Quin and Madden, the famous homœpathic practitioners, on seeing the instrument and a few of Mr. Rutter's experiments, they at once conceived that it offered the means of demonstrating the action of homœpathic doses of remedies. Experiments were made with about fifty different remedies, from the 3 to 800 dilution; each globule produced exactly the same result as that caused by the same agent in mass."

These were the leading claims of Mr. Rutter's discovery, as given in the report of the first lecture on this subject, delivered by Dr. Quin before the British Homœpathic Society. Dr. Madden has since published a lecture; but alas for Dr. Quin, the "first on the stage" discovers that his, Quin's, experiments were full of fallacies and blunders. He showed that out of sixteen actions of medicines recorded by Dr. Quin, the actions of twelve differed from those produced by the same medicine on himself. This discrepancy staggered the homœpathic faculty,—the bubble burst. Madden turns State's evidence, and proffers himself as a witness at the bar of public opinion against his two accomplices, Rutter and Quin.

The aim of the homœpathic organs, which a few week's ago proclaimed this as a wonderful and brilliant discovery, is now to let them all down as gently as possible. It is discovered that all the wonderful currents of the New Magnetic Indicator has depended upon the will of the operator. How this exercise of the will is to be distinguished from voluntary and responsible fraud, we leave the reader to determine.

It is almost useless to speculate on the real nature and origin of Mr. Rutter's proceedings. It seems pretty certain that his instruments and experiments are plagiarisms from some nonsensical writings of Herbert Muyo. However, the incomprehensible extent of the folly or fraud shown in the whole affair, renders it difficult to ascertain the springs and motives of the chief actors. Nothing but a determination to be deceived, or the utmost conceivable facility for self-deception, could have led persons, having the stature and years of adult men, to pin doctrines, which they profess to hold in reverence, to a silly and babyish toy. Nothing but this could have led them to forget the triple movement discovered, all too late, by Dr. Madden, to lose sight of the tendency of a weight attached to a silk thread to rotate, and of muscular unsteadiness and arterial action to impart motion in an instrument poised with the utmost delicacy. A. S. COPEMAN.

Utica, N. Y.

For the Scientific American.

The Sinking of Ice.

In No. 2, Vol. 6, of the Scientific American, there is an article on the above subject, which would go to prove that it cannot sink; but, as it is undecided, I will give a reason that may account for it. When the south wind has been blowing, or the sun shining, for some time, the body of water becomes warm and the ice very spongy. The water that is contained in, and in contact with the spongy ice, will be cooled to nearly the freezing point, which is its most dense state; and may not the difference in density of this water, and the water underneath, be sufficient to make the ice sink? Anchor ice, I think, is formed on the bottom in swift shallow places. The reason is, the water being agitated and not freezing, the stones on the bottom get chilled, so that ice forms on them until it becomes of sufficient bulk, when it is carried away by the current. I have frequently seen it on the bottom and just as it was rising, but never except in swift shallow places. The ice often brings the stones up with it, and carries them down the stream. If the matter is of sufficient importance, by calling attention to it now, some one may be induced to make accurate observations (as they will in a short time have ample opportunity), and the facts of the case be ascertained. F. C.

Elmira, January 20, 1852.

Flax Cotton.

M. Clausen, of whom so much has been said, has opened a manufactory at Stepney-Green, Eng., for the the purpose of carrying out his discoveries in flax cotton.

Chevalier Clausen, by his method, takes the flax-straw as it it comes from the field; but he proposes that the farmer should mechanically separate the straw from the fibre by the use of a very simple machine, which pounds or breaks the straw and effects the separation; this reduces the substance to one-half its bulk, and the straw may be returned to the soil, or, mixed with cake, crushed seed, &c., be used as cattle food. Now, the stem of the flax plant consists of three parts—the shove or wood, the pure resin or glutinous matter which causes these fibres to adhere together. The first has been got rid of by the farmer by the process described, and it remains to remove the third constituent, namely, the glutinous substances. Chevalier Clausen contends that the present system of steeping in water, either hot or cold, will not effect this, as a large portion of them are insoluble in water, but he has recourse to chemical agents. The fibre is either boiled in a weak caustic soda for four hours, or steeped in a cold solution for twenty-four hours. It is then soured in a bath consisting of 500 parts of water to one of sulphuric acid, washed, dried, and further cleaned, scutched, and so on; flax obtained in this way, being free from all coloring matters, may be bleached afterwards with greater ease, and as the plant need not be cut till ripe, the grower has the advantage of fully ripened seed, and a greater weight per acre of pure fibre. It is calculated that from four tons of flax straw, one of fibre may be obtained.

The fibre is then cut into short lengths by a circular knived cutting machine. The appliances for the metamorphosis of flax into cotton are very simple, consisting of four wooden vats, containing solutions which will presently be named, and an open wooden box, or cage rather, made of strips of wood, which by means of a rope and block, is suspended from a small carriage running along a transverse beam overhead, and thus can be lowered and raised, successively into and from the four vats. The cage being partly filled with the cut flax or waste "tow," is lowered into the first vat, containing a solution of cold water and 10 per cent. of common carbonate of soda. It remains in this about an hour, by which time the liquid has penetrated by capillary attraction every part of the small tubes. The cage is then hoisted up and lowered into the next vat, containing one part of sulphuric acid to 200 parts of water. This acid, by its superior affinity for soda, forms a sulphate of soda with it, and liberates the carbonic acid, which, in its escape, acts mechanically by its elastic force, and separates the fine flax filaments from each other.

The flax fibre soaked in the solution of subcarbonate of soda is no sooner immersed in the vessel containing the acidulated water, than its character at once changes from that of a damp rigid aggregation of flax to a light expansive mass of cottony texture, increasing in size like leavening dough or an expanding sponge. It is then immersed in a second bath of carbonate of soda solution, and if only required to be used in an unbleached state, may be washed and dried. If, however, it is to be bleached, it is immersed in a fourth vat, containing a solution of hypochlorite of magnesia, and in about fifteen minutes attains the color, as in a previous similar time it had acquired the texture of cotton. In fact, it goes in brown flax, and in less than one hour comes out white cotton. It is then washed, drained in baskets, dried in cakes, hanging across iron horses in stove rooms heated to 98° Fahrenheit, and is then ready to be teased like cotton.

Keeping Cattle Warm.

Cattle will eat all that nature requires in a good warm barn, if it is fed to them, and they can have seasonable supplies of water. But nature will require more in an open barn, and more still in a cold yard. The fuel to feed the fires within will always bear a proportion to the cold atmosphere surrounding the surface of the body without, which is to be warmed, in order to keep the creature comfortable. It is like placing your stove outside of the house to warm the circumambient air, instead of placing it within your snug little parlor. The extra out-door appetite is caused mainly, if not entirely, by the extra exposure demanding extra fuel.—[Granite Farmer.

[We hope our farmers, one and all, will pay attention to, and act upon the above information. There is philosophy in the suggestions, they accord with the well known laws of animal chemistry. Cattle that are not well housed in winter, are always stunted and poor, and at the same time they require more food than if they were kept warm; warm stables save hay.

Resuscitation of Frozen Fish.

Prof. S. D Lathrop, in a letter to one of the editors of the American Journal of Sciences, states as a fact well known to those who are accustomed to take fish, such as the common perch and the lake mullet, from Lake Champlain, in the winter, that these fish may be frozen perfectly solid and be transported many miles and kept several days, when upon thawing them out in a tub of cold water they will be found to be alive and active. He has taken some pains to corroborate this fact by inquiry, and has found it to be well sustained by evidence, though he has never seen it. He has found the same fact sustained in the case of the buffalo fish taken from the Rock river. —[Exchange.

[Is this really so? will some of our readers give us what they have seen with their own eyes on this subject.

Manufacturing in Macon, Ga.

The people of Macon are agitating the project of digging a canal some six or seven miles long, by which the water is to be brought into the city for manufacturing purposes. Mr. Holcombe, the Engineer, has surveyed the work, and reports that it can be done at a cost of $212,500. It is estimated that this would afford power sufficient for twelve factories of five hundred spindles each.

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Recent Foreign Inventions.

PAPIER MACHE.—Mr. C. F. Bielefeld, of London, obtained a patent for an improvement in the manufacture of papier mache, an article which has recently received considerable attention in our country. The accompanying description is a clear abstract of the patent as specified, and it will be found extremely interesting not only to the few who have recently introduced the manufacture into New York, but to hundreds of our readers beside, for it is very evident that the substance here described can be plentifully manufactured in the United States, and applied to a thousand useful purposes.

"Sheets of papier-mache, of considerable thickness, have been commonly produced by causing numerous sheets of paper to be successively pasted together and dried, until the required thickness of sheet is obtained. The desired thickness of sheet has also been obtained by piling a suitable number of sheets of paper in a wet state (as they come from the paper-mould or seive), one upon another, and then expressing the water by a press, and drying the sheet, so produced, whilst in a state of compression, between metal plates. Sheets of less thickness have been made by running the pulp on to a mould or seive, having a frame thereon corresponding in depth to the thickness of sheet required, and then pressing such sheets between felts and drying them. Moulded ornaments, and other articles of papier mache have been usually manufactured by reducing fibrous and other matters by grinding, in a suitable machine, to the consistency of stiff dough or putty, and then moulding and drying the same.

The above remarks are made in order to point out more clearly, the nature of this invention, which consists in rolling or pressing fibrous and other matters, ground to the state of stiff dough or putty, into sheets, and treating such sheets with oil and heat, in like manner to that in which sheets and moulded articles of papier-mache, made by the above methods, have been heretofore treated.

Either flat or roller presses may be used in carrying out this invention. The press which the patentee prefers to employ consists of a rectangular moving table, with a pressing-roller above it. The table has a rack on each side, and is supported in such a manner that it may be moved to and fro at the same surface speed as the pressing-roller; for which purpose two cog wheels are fixed on the axis of the roller, and gear into the racks affixed to the table; and the roller is kept pressed down upon the table by weighted levers. The table supports a wooden platform, somewhat larger than the intended sheet of papier-mache; over this platform is spread a sheet of moistened canvass or other suitable fabric; and upon the fabric is laid a rectangular or other frame of wood, corresponding in height to the thickness of the sheet of papier-mache, or substance in the nature thereof, to such an extent, that considerable pressure will be necessary to reduce the same to the level of the frame. Over the composition another sheet of moistened canvass or other fabric is laid; and then the pressing-roller being caused to rotate, the table carries the platform, with the plastic papier-mache thereon, beneath the roller. The composition is passed several times beneath the roller, until it is considered to be sufficiently pressed; after which the upper sheet of moistened fabric is removed, and a flat frame or rack of wood (composed of numerous bars) is laid upon the sheet of papier-mache; then the wooden rack and platform, with the sheet of papier-mache between them, are turned over; and the platform and the first-named sheet of canvass are now removed,—leaving the papier-mache upon the rack to dry. During the process of drying, the sheets are turned over from time to time; and the patentee prefers, when time and season will permit, to dry by the ordinary atmosphere in sheds, or otherwise in rooms, heated to a slight degree above summer heat: the longer the time allowed for drying the better will be the result. The sheets, by day, are placed in a stove, heated from 150° to 180° Fah., and left therein until heated throughout; and they are then immersed in boiled oil, which is kept at a temperature of from 150° to 180°. The sheets are kept in the oil for a greater or less time, according to the thickness thereof and the degree of saturation desired; for sheets of one inch thick, half an hour has been found sufficient. After saturation with oil, the sheets are again dried on racks, either by the atmosphere in sheds or in heated rooms; and when they appear to be dry, they are kept for some time in a stove, heated to 180°.

The patentee states, that the above is the practice pursued by him when the sheets are to be used for forming partitions in steam and other vessels, and for panelling and other work of the cabins of such vessels, or the parts of railway and other carriages, and for making furniture and other structures where it is desirable to use a material that shall be little affected by extremes of temperature.

The sheets, produced as above described, may be cut into the desired forms, and framed together in panels or otherwise; and the surfaces may be planed, smoothed, and polished, as when operating on other papier-mache; and they may be varnished without painting in which case various effects may be obtained by mixing colors with the fibrous materials employed; or the papier-mache may be painted and ornamented in like manner to carriage-painting. Various compositions of fibrous with other matters may be used in carrying out this invention; but the patentee prefers the following, although he does not confine himself thereto:—He makes a paste by boiling together 80 lbs. of water, 32 lbs. of flour, 9 lbs. of alum, and 1 lb. of copperas; with this paste he mixes 15 lbs. of rosin, dissolved by 10 lbs. of boiled oil, adding 1 lb. of litharge; and then he adds to the mixture from 55 to 60 lbs. of dry rag-dust or other suitable fibre, and grinds the whole together. He has found that paper makers' "half stuff" or pulp may be used, when deprived of fluidity to such an extent that it is of a like consistency to stiff dough or putty. When size is used in preparing the fibrous and other matters, it is best to employ a hollow pressing roller, heated by steam. In the manufacture of sheets of papier-mache by the above process, if one or both of the fabrics, which are used when pressing, be left adhering to the surface or surfaces of the sheet, instead of removing the same previous to drying, the fabric or fabrics will continue to adhere when the sheet is finished and form part thereof.—[Newton's Journal.

Early Days of Steam Navigation.

Charles King, L. L. D., President of Columbia College, recently delivered an address before the Mechanics' Society of this city, in which are some very interesting reminiscences of early steamboat navigation in America, which we present in a condensed form, and which will be of great interest to our readers.

"Let us go back to 1806, from which dates the era of steam applied to navigation, and the great discovery—for the successful application of a known force in a new manner, and to new and before unthought-of purposes, may justly be styled a discovery—belongs to our city, of which the first Fulton was a resident, and from which the first boat—the Clermont—started for Albany on the 7th day of August, 1807. An hour might be readily occupied with the recital of the hopes and the fears, the almost angry doubts and the passionate sneers, with which the announcement was received that a boat without sails or oars was to be forced up the Hudson to Albany, against wind and tide, in a shorter time than was ever dreamed of, and all by the vapor which the housewife's tea-pot sends curling into the air, to vanish in an instant from sight. For, at that time, steam engines as applied to the various processes of manufacturing or other industry on land, were little known of generally, and the whole United States furnished but one machine-shop or foundry where a steam engine could be made, and that was opposite to this city, at Hoboken, in the works of Col. Stevens of whom—more anon.

But the Clermont, in the sight of a jeering rather than encouraging crowd, got under way, and slowly, very slowly, as we now estimate speed, forged ahead; Robert Fulton, and a few chosen friends and faithful mechanics only on board—for he refused passengers generally, only consenting, after much solicitation, to take six, of whom the late Selah Strong was one, and perhaps the first man who ever paid for a steamboat passage up the Hudson.

In 32 hours, running time, after stopping one night at the seat of R. R. Livingston, the Clermont made her appearance at Albany, having received in her fiery track along the river abundant manifestations of interest, astonishment, and even terror—and thereby securing the monopoly promised by act of Legislature to any persons who should accomplish the distance by steam between Albany and New York within 36 hours. The return trip was made in 30 continuous hours, averaging five miles an hour. The engine of this boat was made in the workshop of the famous Watt, at Birmingham.

None of the papers at that day described the voyage or alluded to it, but one, "The American Citizen," edited by an Englishman named Cheetham. The papers were engaged in disgraceful political quarrels, they could not talk of a steamboat, no, no.

The palm thus gained by Fulton was closely contested by John Stevens, of Hoboken, who, long in concert with R. R. Livingston and Robert Fulton, had made experiments in steam as a means of propulsion, but now aided by the genius and practical mechanical skill of his son, R. L. Stevens, was operating separately. Almost simultaneously, but yet behind by that fatal quarter of an hour which determines the fate of so many enterprises, and of so many human beings, both men and women, Mr. Stevens produced, independently of Fulton's plans and experiments, his steamboat Phœnix; but precluded by the monopoly which Fulton's success had obtained for him of the waters of New York, Mr. Stevens first employed her as a passage boat between this city and new Brunswick, and finally conceived the bold purpose of sending her round to Philadelphia by sea; and he executed it successfully. His son, Robert L. Stevens, went round with the boat in the month of June, 1808. A fierce storm overtook them. A schooner in company was driven off to sea, and was absent many days, but the Phœnix made a safe harbor at Barnegat, whence, when the storm abated, she proceeded safely to Philadelphia, and plied many years between that city and Trenton. Mr. Stevens thus earned indisputably the honor of first venturing and succeeding to encounter the might of the ocean with a steam propelled vessel. When the Phœnix went round to Philadelphia, the Atlantic, and no other sea, had ever known the domination of victorious steam.

The limit, the utmost limit of speed, to which Fulton hoped or thought it possible to attain, was nine miles an hour, and that he did in later boats, but it was again reserved for the name of Stevens, after long and numerous experiments cautiously conducted and tested, as to the form of vessel best calculated to overcome the resistance of the dense medium through which it was to make its way, to send forth on the Hudson—a boat as superior in size and equipments as in speed to all before it, and to travel at the rate of 13½ miles per hour. Even that is now slow, and the 150 miles which separate us from Albany are passed over by steamboats—not one but many—in eight or nine hours; and the actual rate of nineteen and even twenty miles has been attained by some of the later boats. But when the New Philadelphia, R. L. Steven's boat, in 1814, started off at the rate of 13½ per hour, even the senses were distrusted, philosophy, which had calculated only the resistance of the medium to the forms then used, was at fault, and what had been actually done was pronounced impossible. But the steady, far-reaching mind of the younger Stevens knew the secret of his success—that it was due to the form he had given to his vessel. He saw too, after some trips, that even that form was far from the perfection he had designed, and accordingly he went to Brown & Bell, then, and even yet I believe, eminent ship builders, and begged them to put on the New Philadelphia a long, sharp false bow, of which he gave them the drawing. After considering the proposition, they declined, declaring themselves unwilling to encounter the redicule of what struck them as so unseemly a work, and Mr. Bell added that it would be called Bell's nose, and would be the general laughing-stock. Repulsed, but not disconcerted, young Stevens, sure of his own conclusions, built a false bow at his own shop, put it on, and obtained in consequence an additional speed of several miles the hour. With the New Philadelphia commenced the first day line to Albany.—This was the commencement of the new models, which, alike in clipper steamers and clipper ships, have given to both classes of our build and navigation—for there is a great deal, too, in the latter—our superiority over the world.

By the lucky quarter of an hour, Fulton carried away from Stevens the prize of the first successful steamboat. But years before, viz. 1804, Col. Stevens, whose fertile and ingenious mind was specially turned to mechanical inventions, had constructed and put into operation a steamboat of which the motive power was a propeller, the propeller which at this day I believe is admitted in form and proportion to be the best. This boat was a small one. In it Col. Stevens put an engine with tubular boilers, the first ever made, now universal in locomotives. The machinery, made under his own direction and in his own shop at Hoboken, set in motion two propellers, of five feet diameter each, and each furnished with four blades having the proper twist—to obtain which he had the greatest difficulty with his workmen—and set at an angle of about 35 degrees. This vessel—used only for testing the possibility of steam-navigation—so completely demonstrated the fact that Col. Stevens applied it on a larger scale in 1806, to a pirouge, 50 feet long, 12 wide, 7 deep—which attained very considerable speed. Encouraged thereby, he commenced the Phœnix with side-wheels, to whose success allusion has already been made. It is proof of the remarkable accuracy and skill of the Hoboken workshop, that the engine of the first small propeller, carefully preserved, was set up again not more than 10 or 12 years ago, in a new vessel, and, without altering a screw, worked most successfuly. The old hull and the blades of the propeller are yet in existence at Hoboken.

Not the least useful purpose to which steam was applied, about those times, was to the ferry-boats, which dart at all hours across the rivers, separating at once from, and binding us to the shores opposite our Island.

The first step in advance was the introduction of horse-boats, twin-boats with the wheel in the centre, set in motion by a sort of horizontal tread-mill wheel on which horses were made to step. For horses, steam was substituted; first by Fulton at the Fulton Ferry. Then came the single boats, with side-wheels, and propelled by steam, of which the first was the Hoboken, by R. L. Stevens, in 1822. She still is at work, enlarged and sound as ever, and much faster than at first. As indispensable to the new ferry-boats, came—of Fulton's devising—the floating bridges at the ferries which rise and fall with the tide, aided by counterbalancing weights on shore; an invention ingenious in itself, and, as I have said, the indispensable complements of steam ferry-boats. The spring piles now used to deaden the force of the blow as the boat approaches the ferry, and to direct her course aright, are due to R. L. Stevens, who introduced them in 1822.

In the year 1818, the Savannah, a New York built ship, with side wheels and propelled by steam and sails, went hence to Petersburgh, via Liverpool, and returned safely; and a year later, the Robert Fulton, built by Henry Eckford, under the superintendence of Jasper Lynch, for David Dunham, plied as a steam-packet between this city and New Orleans, but, the business not paying, her engines were taken out and she was sold to the Brazilian Government as a ship-of-war, being of 700 tons. I have a memorial of this ship, as it were from the grave. [The lecturer here unrolled and exhibited to the audience, a colored drawing of the Robert Fulton, made in 1821—deposited under one of the marble columns erected that year in the South entrance of the Park, and disinterred, uninjured, in 1848, when those columns were removed.]

Thus, it may be said, in every sense of the word, 'America is the mother of steam navigation,' tubular boilers and propellers."

A track of rails has been laid on the ice over the Susquehanna river at Havre de Grace. The trains pass over it without delay.

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NEW INVENTIONS.

Alarm for Tills and Drawers.

Mr. F. C. Goffin, of No. 293 Rivington st., this city, has invented a useful improvement for tills, drawers, &c., which will no doubt soon be very generally applied, as it will cost but little to procure them. It consists in applying a bell or gong to a till or a drawer, or to a door of a safe, or to any place of a secret kind. The alarm is so placed that no person can see it, and those who know about it, such as the owners of the drawer, till, &c., or their clerks, can operate the the drawer, &c., without working the alarm; to strangers, therefore, it is so set that they operate the alarm, and thus they can be detected when engaged with intent of burglary. It is a simple, ingenious, and cheap alarm.

Measures have been taken to secure a patent.

Superior Sand Paper.

Among our advertisements is one of Mr. William B. Parsons. We sedlom notice things which appear in our advertising columns, from a fear that it might—and very naturally too—be supposed, that we flattered for the trade. We never do this, because it is not right. We say here that we have examined the sand paper of the firm spoken of above, and as we know that there is much indifferent sand and emery paper in the market, which gives great trouble to our joiners, and cabinet-makers especially, we can recommend this as being the best we have ever seen. It is tough and durable, and very evenly. It is a great improvement in this useful article.

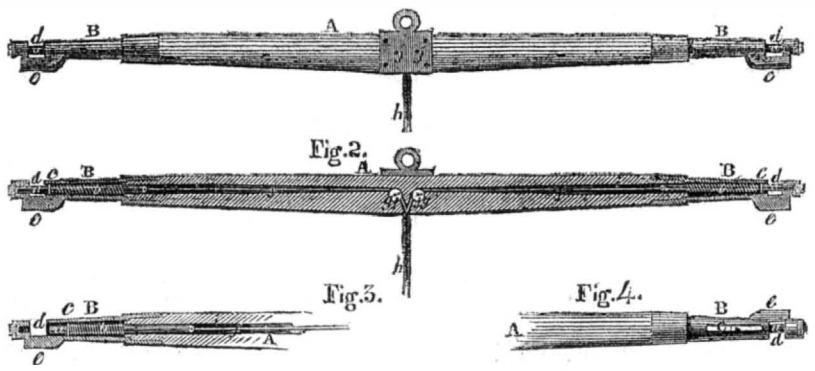
Safety Whiffletree.

The accompanying engravings represent an improved Safety Whiffletree, invented by Mr. Nelson Adams, of Columbus, Warren Co., Pa., who has taken measures to secure a patent for the same.

Figure 1 is a plan view; fig. 2 is a horizontal section; figure 3 is a horizontal section of one end of the whiffletree—the sliding bolt being drawn in, and fig. 4 is an under view of one end of a whiffletree, showing the slide by which the sliding bolt is drawn in, when it is desired to fasten the trace to the whiffletree. The same letters of reference indicate like parts.

The nature of this invention consists in having a hollow whiffletree, with interior sliding catch bolts, to which is attached a chain or cord—at the command of the driver—so that if the horse should get unmanageable, by simply pulling the cord or chain the traces are set free, and the vehicle is left behind. In many cases this invention is one of necessitous importance. A is the whiffletree, and B B are two metallic collars or tubes which fit on the whiffletree, one on each end, as shown particularly in the horizontal section; *a a* are two sliding bolts which fit in the tubes, a spiral spring, *b*, being coiled around each bolt, the inner ends of the springs resting against the ends of the whiffletree. The outer ends of the springs bear against buttons, *c c*, on each bolt near recesses, *d d*; these recesses run transversely across the tubes, the extreme ends of the tubes being connected to the other portions by projections, *e e*, at the sides. The bolts, *a a*, cross the recesses and enter the ends of the tubes. To the inner end of each bolt there is attached a cord or chain, *f*, this cord or chain runs longitudinally in the whiffletree, and passes round the pulleys, *s s*, and then unites, forming a double cord at *h*, which passes into the vehicle. There is an opening or hole, *i*, in the whiffletree at each end, for the bolts to work in, and also holes for the cord or chain, *f*. There are also recesses for the small pulleys, *g g*; they are inclosed in the inside of the whiffletree; *j j* are the axes of the pulleys. The spiral springs keep the sliding bolts distended outwards, to retain the traces in their proper places. The traces are pushed into the recesses, *d d*, and the sliding bolts pass through their eyes like common bolts. There is a slide, C (shown in fig. 4), which is attached to each sliding bolt, *a a*, by a small pin; there is also a slot in each end of the whiffletree, so that by pressing this slide, C, with the thumb and finger, the sliding bolt, *a*, will be drawn in, and the end of the trace allowed to enter the recess, *d*; by taking the hand off the slide, C, the bolt shoots into the eye of the trace, and thus the horse is harnessed to the vehicle. The whiffletree may be made of cast metal or of wood. The devices to make it a safety whiffletree are simple, and will, we believe, be understood by all. The utility of this whiffletree is self-evident, and we hope it will soon be very generally adopted. More information may be obtained by letter addressed to the inventor.

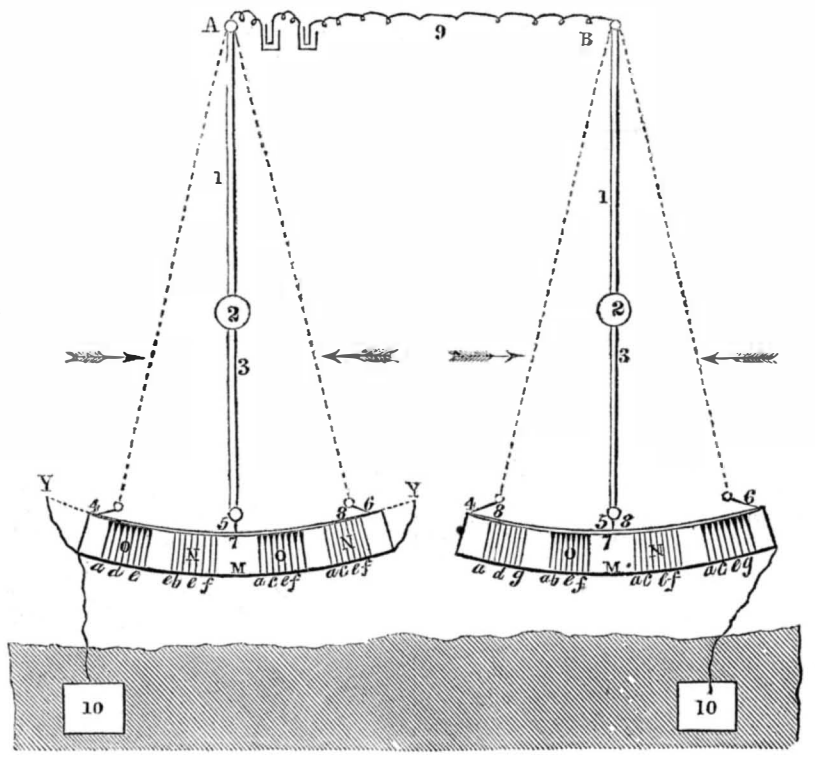
Fig. 1.



NEW CLOCK TELEGRAPH.

The accompanying engraving represents a Telegraph recently patented in England in the name of Alfred Vincent Newton, Esq. It relates to an arrangement of apparatus, whereby two or more persons at distant places can, by the agency of electricity, receive or send intelligence by signals through the medium of one wire or main conductor at the same time. The rapidity or closeness in the order of succession of the signals, together with the indefinitely short time required for the passage of the electricity in conveying or transmitting the signal or electric action, is such that all persons employed in these telegraphic operations can be continually and simultaneously communicating, as though each had the distinct and separate use of the main wire for the whole time required for his particular message. By the means herein adopted, the same practical telegraphic results are obtained, through the agency of one wire, or main conductor, as in the several kinds of electric telegraphs before known or used, requiring several distinct wires of communication.

The engraving represents two separate stations, at A and B, furnished with the necessary apparatus, whereby to transmit and receive intelligence. Suppose A to be the standard station, a pendulum, I, is erected at each, which has an oscillatory motion communicated to, and maintained in it, by means of wheel-work, having suitable maintaining power, such as a spring or weight, as in the ordinary clock. These pendulums must be so regulated in their motion, as to move in unison with each other, that is to say, they must both



move from left to right, which is regulated and determined, as will be afterwards explained; 2 is the bob or weight of the pendulum; beyond this weight a rod, 3, is extended, to give the extent of motion at the extremity required for the facilities of transmitting and receiving singals, which will depend in a great measure on the number of parties desiring simultaneous communication; 4, 5, 6, and 4, 7, 6, describe two path-ways, which have suitable grooves in the upper surface; these grooves receive the end of a link, 8, attached to the pendulum-rod, which is so arranged, with respect to the paths or grooves, that when traversing in one direction, it moves in the groove or path 4, 5, 6, while, in the opposite direction, it moves in the path or groove, 4, 7, 6. The end of the link is held by a suitable form retained in the groove, taking care that sufficient freedom is permitted, so that it will not produce any irregularities in the motion of the pendulum. The pendulum-rod, 1, 3, and link, 8 are of material suitable for conducting electricity. The point of suspension of the pendulum is placed in communication with a Leyden jar, charged with electricity by an electrical machine, or voltaic battery, and from whence, also, the wire, 9, places it in similar communication with the pendulum at B, the wire, 9, being the line wire through which the whole of the signals are to be transmitted; 10, 10 are the earth-plates which complete the circuit, as well understood. Supposing A to be the standard pendulum, and the arc of the pendulum's motion is from Y to Y, a wire communicates from the earth-plate at that station, (the point Y), on the left where there are two parallel metal faces placed near together, and at Y, on the right one, is another such face, to which another wire communicates from the segmental bar, M M, which is permanently in connection with the earth-plate, and is a conductor of the electric fluid. If the pendulums are set in motion, so as to swing from Y to Y, and with all the necessary connections above described, the following observations will determine whether they oscillate in unison. If the motions of the pendulums agree on passing the point, Y, on the left, at station B, two sparks will be visible, by reason of the two faces situate at that point, at station A, while at Y, on the right, only one spark will be visible; but should their motions disagree, then these sparks will be visible at some other point, denoting the inaccuracy, which must be rectified before any communication can be made. This can readily be effected by means of suitable signals being transmitted specially for that purpose. The motions of the pendulums, when corrected, will be regulated by the wheel-work by which they are actuated, and which, if desired, may have a separate pendulum for that purpose.

N N are two series of the accessory short wires before mentioned, for transmitting the several signals, and O O are two similar series of wires for receiving signals. It will be observed that the relative positiohs of these several series are reversed in the different stations, so that supposing one pendulum to be passing over the transmitting wires, N, at one station, the other would be opposite the receiving wires of the other station. Although only eight of each of these wires are shown, it is intended that each series should consist of at least twenty-six, to accord with the letters in the alphabet, which they are severally intended to represent, as marked. The receiving wires are fixed permanently between the path 4, 7, 6, and the segmental bar M; the upper surfaces of these wires may be each about half-an-inch broad, which faces are level with the path in which the link, 8, is in contact, and which effects contact with each of these wires successively, as it passes over them. The other series of wires, N N, for transmitting signals, is of corresponding numbers, but simply consists of wires, which are also supported in the bar, M, but do not quite reach the path, 4, 7, 6, but are capable of being slid up to the same level as the faces of the receiving wires. Suitable arrangements are made for keeping the transmitting wires down, unless elevated for the purpose of transmission, by the pressure of the finger, or suitable apparatus in connection therewith, acted on by the operator.

One oscillation of the pendulum, that is, to and fro, is supposed to occupy the time absolutely necessary for a person to transmit or note a signal; a succession of signals is therefore produced at so many repeated and successive oscillations. Thus supposing a person to be engaged in transmitting signals from station A to station B, he will engross the use of one series of transmitting wires, N; by the proper use of the wires in succession, he may spell the several words which he desires to communicate. By elevating the particular letter of the series, say *a*, the wire so denominated will effect contact with the link, 8, as it passes, which will complete the circuit at this station; and simultaneously with the contact of the link, 8, at station A, the link, 8, at station B, will be in a precisely similar situation with respect to the receiving wire denominated *a*, at that station, which is indicated by a spark and noted down as the signal. The pendulum having completed its oscillation in the direction it is then moving, then vibrates in the opposite direction, but without effect, as the link, 8, returns by the other part. On reversing its motion again, the person transmitting the signals, having relieved the wire corresponding to letter *a*, raises another wire, say corresponding to the letter *c*, which is in like manner indicated by a spark on the passing of the pendulum link, 8, past the points of transmission and reception, as before described. In this manner a succession of signals may be transmitted, one at each double oscillation of the pendulum, so as to compose any communication it may be desired to make. In like manner, three other persons may be employed in transmitting and receiving intelligence at each station, that is to say, eight persons in all; two at each station making use of the transmitting wires, and two at each station receiving intelligence. By employing a greater number of sets of the transmitting and receiving wires, a greater number of persons may be simultaneously engaged in transmitting and receiving intelligence through one and the same line wire, which will only be limited by the extent of the arc of vibration restricting the repetition of the sets of wires. The sets of wires should be confined to the smallest possible space consistent to insure the requisite certainty of action. The action of this telegraph, although singular, must of course be much lower than the Morse or Bain telegraphs.

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Scientific American

NEW-YORK, JANUARY 31, 1852.

Prizes for Inventions.

We would call the attention of our inventors to an advertisement on our proper page for that purpose. The offers are for useful improvements connected with Railroads. We believe them to be fair, generous, and honorable to Mr. Ray. Having said this much, we cannot help throwing out some remarks to combat an idea which seems to be entertained by some, viz., that "the arts are now so perfect and complete as to leave little room for further improvement." This is not so, and never will be, with respect to the work of men's hands; great though the achievements of men have been, still imperfection is written upon them all. The works of God, the Great Creator, the Divine Architect and Mechanic, are alone perfect. The human frame, that machine of machines, is no more perfect to-day than when it sprung, bounding with life and beauty, from the inanimate dust of Paradise. This we cannot say of the works of man; the real perfect must ever be before us. When we look behind and see what progress man has made in invention, and then compare what he has done with the works of nature, we always find more imperfections in the former, and more perfection in the latter. It is true, indeed, in respect to the mechanic arts, that the present state of them may be called perfection in comparison with the state in which they were a century ago, but this should not damp the ardor of the ingenious mechanic. There is still plenty of room for invention and improvement; yea, and it will ever be so; with every new achievement, new wants will spring up; and, to provide for these, the inventor will still have to exercise his genius and the mechanic his cultivated skill. We can go on towards perfection, but can never reach it; and the more perfect the arts become, even after many ages will have passed away, still, something will always be wanting to complete the picture. With all our perfection in the arts, more new inventions are demanded to-day than ever there were at any period of the world's history; and the mechanic who may be living a hundred years hence will have the same story to tell. Here we have prizes offered for five new improvements, relating to railroads alone, and when we consider that it is only twenty years since the first scream of the locomotive was heard in our land—that not a single iron horse was seen panting along the iron track in the United States at that time, and that now his iron hoofs are heard thundering through the heart of the Green Mountains, over the Hudson, down the slopes of the Alleghenies, and along the banks of the Mississippi, well may we hold up that man to ridicule who even hints at a limitation to new inventions and discoveries. In twenty years we have built a track of twelve thousand miles long for the iron steed—what a race-course! In a few years more he will commence his race wet with the spray of the Atlantic, and will not slack his iron nerves till he has snuffed the breezes of the Pacific.

Inventors of America! the progress of invention in your land is entrusted to your keeping.

Measures of Length.

A correspondent writes us inquiring "what is the standard for tape or rule measures?" He says that he has a yard-stick and a two foot measure, and the one is longer than the one of his neighbor, and shorter than the other by about one-sixteenth of an inch. The fault is certainly not with the standard of measure, but the makers of those instruments. The standard of a yard is to be compared with the vibration of a pendulum in a vacuum at the level of the sea in London. The beat should be 39·1393 inches in a second, and the yard should be as 36 to this. This measure was adopted by an Act of Parliament, and is the one we use in America, our rules being derived from the English

The Cold Weather.

For twenty years we have had no such cold weather, in any winter, as we have had during the resent one. On Tuesday morning of last week thousands crossed the ice on foot between Brooklyn and New York. On Thursday morning, also, great numbers crossed on foot. The greatest cold has been 4° below zero. This, however, is nothing to 36°, at which point it has been in Franconia, N. H.

Extension of the Woodworth Patent.

Some time ago we directed the attention of "all those concerned," to the efforts which were about to be made for the extension of the famous Woodworth Patent, for seven years beyond the term when it shall expire—which will be on the 27th day of December, 1856, nearly four years from the present date. Systematic and well-planned efforts to get the present Patent Committees of the two Houses of Congress to favor the extension of the patent, will be made, and no means spared to get the Bill passed. It is time that those who honestly believe themselves to be morally wronged by the monopoly of this patent were up and doing. It is for you, gentlemen, to organize and act. Things are managed in Washington with so much subtilty, that the first you will know will perhaps be an extension of the patent of William Woodworth to his heirs, &c., for a period of seven years from 1855. It may appear strange to some of our citizens that any public body in this free country would do such a thing—would dare to do it; but despotic and unjust grants of monopolies are not peculiar to kings and autocrats. Unless our rulers are watched, they will forget themselves; the people must let them know that their eyes are upon them, and that they will call them to account for every vote they give. There are Senators and Members in Congress against whom the breath of suspicion cannot be raised; let their attention be directed to this case.

It is not long since the late Common Council of the great city of New York passed a contract granting a monopoly to a Gas Company in the city, for seventeen years, and the grant was actually legislating for their successors, as it was not to take effect until they—the grantees—were six months out of office. If the present Congress extend the Woodworth patent five years before its expiration, it will exhibit a want of decency without a parallel; but, then, such considerations may not prevent its extension. The most effectual way to prevent its extension is to petition and use efforts to get the present grant repealed. We do not counsel this, but in consideration of the efforts made for its extension.

The Committees on Patents consist of Moses Norris, Jr., Charles T. James, James Whitcomb, W. C. Dawson, and Truman Smith—these are the Senators. The Committee of the House of Representatives consists of David K. Cartter, of Ohio, M. M. Dimmick, of Pa., W. J. Ward, of Ky., Benj. J. Thurston, of R. I., and Alex. White, of Ala. These gentlemen are the proper persons to whom petitions on patents should be addressed.

Curiosities of Water---Explosions of Steam Boilers.

A respected correspondent, writing to us from Florida, informs us that in conversation with his engineer, a sensible practical man of great experience, who was once an engineer on board of a steamboat that was blown up, and by which he was a great sufferer, he gave it as his opinion, that a very inflammable gas is sometimes generated in steam boilers, and which is not indicated by any particular pressure of the steam. He says he has seen the solder of the steampipes melt at 170 lbs. pressure, and has also seen it melt at only 70 lbs. pressure. He believes that this gas will explode like gunpowder, if it comes in contact with flame. A friend of his made a small boiler of a piece of steam pipe, and furnished it with a safety valve; he got up the steam in it until the safety valve opened, then he put out the fire under the boiler, and applied a torch to the steam issuing from the valve; an explosion like a bomb shell took place, blowing every thing into fragments and scalding him severely.

There can be no doubt but if the water is decomposed in the boiler, a torch applied to the gas issuing from the valve will cause an explosion. Water is composed of two gases, oxygen and hydrogen. These two gases, in the proportions which form water, will explode with fearful violence if a spark is applied to them, the product of the explosive gases, strange no doubt to some, is water. Explosions will take place in boilers when a torch is applied to the gases, if the water be decomposed. Red-hot iron will decompose water; the oxygen will combine with the iron and the hydrogen will be set free; if this hydrogen is mixed with 8 parts of the atmosphere, and a torch applied to it, it will explode with great violence. This, in all likelihood, was the cause of the model boiler explosion spoken of above. The melting of the solder at the different pressures spoken of is not so much to be wondered at, for there is only about 66° of difference between 70 and 170 lbs. pressure.

There is a question connected with steam which is more strange than any, and yet we seldom here it mentioned. It is this,—water at 212° gives off steam, this steam is totally different in its nature and action from water, and yet it is only 212° also. Why does not the water, at 212°, all flash in a moment, like gunpowder, into steam, that is, to 1700 times its original bulk? We cannot tell; we only know it does not do it. It has been proven by Faraday, however, that water, perfectly purged of all atmospheric air (which all water contains a portion of), when heated to 300°, explodes instantly; that is, it all flashes at once into steam. There is another property belonging to water not so universally known to engineers as it should be, namely, all the water in a boiler will become steam in a given time, when subjected to a constant heat and great pressure. If a certain amount of water, at the heat of melted ice, be put into a vessel, and a lamp applied to the same, it will be found that if the time occupied to bring the water from melted ice to 212° (the point where steam commences to be given off) be noted, and the lamp kept at the vessel for 5½ times longer, all the water will be changed into steam; it follows, then, that if a certain amount of heat be applied to water, for 5½ times the period it took to raise the temperature from that of melted ice to the steam point, all the water will be in a state to flash at once into 1700 times its original bulk. A cubic foot of water, converted into steam, occupies 1700 times the space it formerly occupied, if not compressed; and two cubic feet of water, converted into steam, occupies a space of 3400 cubic feet. The pressure exerted by such an expansive force is tremendous. If frozen water has burst cannons, is it to be wondered at that heat and water burst boilers? Every engineer should be thoroughly acquainted with all the known chemical and mechanical properties of water and steam. The observations of eminent practical engineers are very valuable; they are situated to observe the phenomena of steam, and there may be many not yet generally known.

The Rappings.

"A rapper in New England, of the Andrew Jackson Davis school, professes to have had a recent communication from the spirit of Ethan Allen, in which he stated that he and Tom Paine were stopping at a hotel kept by John Bunyan."

The above is from an exchange: it is a sad commentary upon the intellectual and moral qualifications which make up the school referred to,—a sad reflection to find a spirit of infidelity creeping into the community under a disguised form, and leading in its train the credulous and simple-minded. What a vast account the leaders of such schemes will have to render.

American Axes in Canada.

The Montreal Herald states that a manufactory of American axes has been established on the Lachine Canal, by Messrs. Scott, Brothers & Co. Their steel and iron are imported from England, and their coal from Pennsylvania. To balance the expense of importing coals, they have the tariffs both of the Province and the United States. They have the Provincial duty of 12½ per cent. against imported hardware, and, instead of the 30 to 40 per cent. duty the United States imposes on British iron and steel, they have the nominal one of 2½ per cent.

The American Axe, it is well known, is of a peculiar shape, curved in its outline, and very thick towards its edge—so that a section of it would not be an acute triangle, but the meeting at an acute angle of two curves. Its use is principally to fell trees, and the object of its peculiar shape is to clear itself when struck into the green wood, so as not to stick, and require an effort to extricate itself, but to come out easily, and rather to recoil, for another blow.

Photography and Gutta Percha.

At a recent meeting of the London Photographic Club, Mr. Fry exhibited some pictures on glass, prepared with a combination of collodion and gutta percha, which the Athenæum speaks of as being charming. The gutta percha is added in small quantities to the collodion (or ethereal solution of gun cotton), in which it readily dissolves, and the latter is then used as in the ordinary collodion process, the picture being developed by pyro-gallic acid. The film on the glass is described as being for more adherent than that obtained by common collodion or by albumen. The sensibility of the preparation is such that a positive copy from a glass negative has been obtained in five seconds by gas light.

The Photographic Club, says the Athenæum, is exciting much interest among artists; and at the last meeting, which was at Mr. Fry's house, Sir Charles Eastlake, Mr. Harding, Mr. Roberts, Mr. George Cruikshank, and a number of other eminent artists, were present.

Felt Cloth Carpets.

The Journal of Commerce gives an account of a novel production which the Bay State Mills—those which recently drove the British shawls out of the market—have produced. It is a felt cloth carpet, printed in block work, and designed according to weight either as a floor cloth or drugget. The threads of wool are not spun or woven, but drawn out and laid together, the whole mass being felted like a hat body. Within a few months, fabrics have been put together in this way, showing a different color on either side, and designed for coats to be made up without lining. The Bay State Mills make this cloth with a white ground, about 40 inches wide, weighing from 4 to 24 ozs. per yard, and print it in elegant carpet designs, showing the richest combination of brilliant colors, and furnish it at 75 to 90 cents per yard.

We do not see why this kind of carpets should not answer as well as the woven kind.

Burning of a Steamship.

The British steamship Amazon, from Southampton to the West Indies, was entirely consumed by fire on the 3rd inst. Out of 165 persons on board, only 19 were saved. The fire was caused by spontaneous combustion. In this case it appears to us that if hose of vulcanized india rubber attached to the steam boilers had been employed, the fire could have been put out easily in its early stages. Will our steamship owners think of this?

Petition for Extension of Patent.

United States Patent Office.—On the petition of Samuel Truscott and George Wolf, of Columbia, Pennsylvania, and James Dougherty, of Philadelphia, Pennsylvania, praying for the extension of a patent granted to them for an "improvement in the mode of making cast-iron wheels to be used on railroads, and applicable to other purposes," for seven years from the expiration of said patent, which takes place on the 17th day of March, A. D. 1852.

It is ordered that the said petition be heard at the Patent Office on Tuesday the 16th of March, next, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

THOS. EWBANK, Com. of Patents.

[The above petition will no doubt excite a great deal of attention among our railroad car wheel makers. This wheel is well known and has been the subject of many patent lawsuits. A verdict of $3,000 was rendered against a company a few years ago for the infringement of a patent.

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LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY, 20th, 1852.

SPLITTING RATTAN—By Joseph Sawyer, of Royalton, Mass.: I claim the employment, in combination with the cutters, for splitting off the strands, of feed rollers or their equivalents, having grooves of the form of an angle or certain of the sides of a polygon, of which the edge or edges of the knife or knives form another side, or other sides, substantially as described.

MASHING MAZE—By Frederick Seitz, of Easton, Pa.: I claim the specified preparation and boiling of the corn for brewing and distilling—boiling it to a jelly before the malt or rye is mashed into it, giving a much larger than the usual yield from cheaper material, by enabling me to use one-half to two-thirds corn for beer, ale, and porter, and to make 19 quarts of whiskey from 60 pounds of corn, (including the usual quantity of malt only, and no rye,) and 21 quarts with rye.

PLANING MACHINES—By G. W. Tolhuet, of Cleveland, Ohio: I am aware that the stocks and cutters of planing machines have been made to yield upon an axle, the centre of which is in line with the cutting edge of the knife. This I do not claim; but I claim hanging the stock at a line above the edge of the cutter, to a spring or weighted lever, in the manner described, in combination with the resting of the front part of the stock upon a fixed surface, so that when the back part of the stock is made to rise, the whole stock is thrown forward and upward, thus keeping the edge of the cutter at the same level, notwithstanding the change in its angle with the bed.

GRAIN HARVESTERS—By Thomas Van Fossen, of Lancaster, Ohio: I claim constructing the reel with hinged or jointed slats, having teeth projecting from them, whereby the grain is more effectually collected, raised, and drawn into the action of the cutters, as described.

I also claim the combination of the teeth with the sliding platform, which teeth rise and fall at the desired time, alternately arresting and releasing the cut grain, whereby the reciprocating motion of the platform will keep the cut grain straight and constantly moving on the platform towards the trough, substantially as described.

CANAL LOCKS—By W W. Virdin, of Havre de Grace, Md.: I claim causing the weight of the descending boat to act as a supplying power to the higher levels, by the use of plunges or floats (any number) fitting in suitable chambers provided with appropriate passages, and communicating with the higher or lower levels for operation, in the manner essentially as described.

MATTRESSES—By John Waters, of Southwark, Pa.: I claim the method described, of securing the springs of spring mattresses to the frame and to each other, so as to leave the tops of the springs free to play or yield to any pressure—viz: by connecting them together by a rivetted leather hinge, and allowing the longitudinal and cross pieces of the frame to pass through a slot in said leather hinges, the whole being combined and arranged in the manner set forth.

MILL FOR GRINDING QUARTZ—By Horatio Blasdell, of New York, N. Y.: I claim the combination of the chilled hollow cylinder and nut, and the grooved chilled rings, and horizontal circular channeled chilled ring plates, with the grooved concave and runner, for breaking, pulverising and powdering gold quartz rock; the said chilled rings and plates being arranged and operating in the manner set forth.

CHURNS—By Edwin B. Clement, of Barnet, Vt.: I claim the application to dashers for churns, of floats that shall close together at their appointed place, when pressed downwards through the cream or milk, forcing the cream or milk through narrow spaces, and opening again when raised from the bottom; claiming the right of composing the dasher of any materials, and in any combination of the above described parts, so as substantially to produce the same effects.

DRILLING STONE—By Henry Goulding, of Boston, Mass.: I claim, first, driving the drills forward and back by adjustable wheels, between the edges of which the drill shaft is placed substantially as described.

Second, I claim turning the drill by placing said wheels at an angle to each other, substantially as described.

Third, I claim feeding the drill forward as the hole is deepened, by making the bearing surface of the wheels which drive the drill in, of greater length than that of the other wheels.

WASHING MACHINES—By John McLaughlin, of Goshner, Ohio: I claim, first, the method of hanging and operating the plunger by means of the shackles and the heavy counterpoise handle as described.

HAND PRINTING PRESSES—By Henry Moeser, of Pittsburgh, Pa.: I claim the tympan plate of a printing hand press, removable by hinges, and counterbalanced, together with the manner of holding the tympan plate in its position, (when lowered down) for the purpose of resisting effectually the pressure exercised from below, substantially as described.

SPINNING MACHINERY—By Oliver Pearl and Henry P. Chandler, of Lawrence, Mass.: We claim the arrangement of the whirl at the base of the flyer, in combination with making the said whirl, and the bearing on which the whirl is placed and rotates, with a passage through them, large enough to allow the bobbin to play within the same, and up and down between the flyer legs, substantially as specified.

SELF-SHARPENING GRINDSTONE—By Jesse Panabecker, of Elizabeth Township, Pa.: I claim the combination of a grindstone with self-acting picker, by which the grindstone is sharpened by its motion or power as described, or in any other manner substantially the same.

NAIL MACHINES—By Samuel G. Reynolds, of Worcester, Mass.: I wish it to be distinctly understood that my invention is susceptible of modifications; as, for instance, instead of making an active pressure on all four faces of the blank to give the required form, the same thing may be accomplished, although not so well, by making active pressure on two faces, and simply presenting resistance to the other two faces.

I claim in the making of wrought nails the employment of the cutter for cutting wedge-formed pieces from a previously rolled plate of equal, or nearly equal thickness, substantially as described, preparatory to, and in combination with, the moulding dies which receive the cut pieces, by suitable conveying apparatus from the cutters, and mould them to the required form by pressure, substantially as specified, so as to give the form by spreading the metal between the dies, instead of elongation, as heretofore practised when making nails from cut blanks.

I also claim the vibrating cutters and the faces or dies, for confining and compressing the nails arranged on both sides of the said cutter, substantially as described, when this is combined with the two stationary cutters, having a space between the two, through which the rod or plate of iron is fed, substantially as described.

BRICK KILNS—By William Linton, of Baltimore, Md.: I claim forming air arches or openings in the kiln, between the fire beds, with lateral openings therein, through which a sufficient amount of air can be supplied equally to all parts of the fire bed at the same time, substantially as described.

CAST AND WROUGHT IRON BLINDS—By Robert White, of Washington, D. C.: I do not claim the combining cast and wrought iron, nor do I claim to be the first to have cast metal round cold metal, and joining the same by that means; but producing a new product or article of manufacture for shutters, doors, &c., whereby I am enabled to use wrought iron slats, and prevent the contraction of the metal, in cooling, from warping the same, by casting the top, centre, and bottom plates separately and distinct from the side plates, and running the side plates to the slats and plates, substantially as set forth.

Great International Patent Cases.

On the first of last December, application was made at the Vice Chancellor's Court, London, Sir G. Turner, presiding, by a Mr. Caldwell, for an injunction to restrain a Dutch Company, named the "Amsterdam Screw Company," from using an improvement on a propeller on the Dutch screw steamship named "Fyenoord." The improvement was the invention of a Mr. Lowe, and was an English patent. The Dutch ship had the improvement; it was constructed in Holland; the owners knew nothing about Lowe's patent, and when it came into English waters, the application was made to restrain the company from using it, or to pay for the privilege. Sir G. Turner, the Vice Chancellor took twenty days to consider the case, and on the 20th of December, gave the following judgment:—

"The circumstances brought before the Court, as a defence to the application, were stated in the affidavit of one of the defendants in the first cause. The affidavit stated that the ship referred to in that cause, the "Fyenoord," was the property of a company in Holland, called the "Amsterdam Steam Screw-Schooner Company;" that the company was composed of numerous partners, all of whom were subjects of the king of Holland, and none of whom were English subjects; that the company was entitled by the law of Holland to trade with steamships, built and fitted up with the propelling power which was the subject of the application; that the screw-propellers in their ships were manufactured and fitted by the defendants at Amsterdam; that the defendants were, and always had been, unacquainted with the invention of James Lowe, and that the deponent believed that all the said ships were built and fitted in ignorance of the existence of any such patent; that no patent had been granted to secure the alleged invention in Holland, and that according to the laws of Holland, it was open to any English subject to apply for and obtain a patent in the kingdom of Holland; that before the vessel in question had been built and fitted in the same manner, and had traded between Amsterdam and London, and made many voyages; that the defendants had not, until Septemper last, heard of any objection to their so trading on the ground of the alleged infringement of the patent; that various other vessels had been built and fitted in Holland with propellers on the same principle, and with the same propelling power; and that it would be a great loss to the company, and to both England and Holland, if the trade, which was profitable to both countries, should be restrained by the Court. This affidavit set forth, in clear and distinct language, the grounds on which the case of the defendants was founded. He was of opinion that he could not withhold the injunction on the ground stated. Upon the general principle, foreigners were subject to the laws of the country in which they happened to be. If there were any cases in which they were subject to their own laws in another country, it was not by force of those laws, but of the laws of the country in which they were, adopting their laws into their own. This was the doctrine laid down by Mr. Justice Story, in his "Conflict of Laws." The principle in this country did not depend upon the general law. It was the subject of special provision by statute. The statute 32nd Henry VIII. chap. 16, sec. 9, provided "that every alien and stranger born out of the King's obeisance, not being denizen, which now or hereafter shall come in or to this realm or elsewhere within the King's dominions, shall, after the 1st day of September next coming, be bounden by and unto the laws and statutes of this realm, and to all and singular the contents of the same." Natural justice, in fact, required that the defendants, when in this country, should be subject to its laws. The question then was, what were the rights of patentees? The crown had, in this kingdom, always exercised the right of interfering with the trade of the country, and had at a former period exercised that power very prejudicially. The abuse of this power had been restrained by the statute of James. In the case of the monopolies reported by Sir Edward Coke, it was held that the Crown had power to grant an exclusive right of trading for a reasonable period, and this was limited by the statute for the term of fourteen years. The statute did not, however, create, but control the power of the Crown to grant patents; but the patentees derived their rights, not from the statute, but from the grant of the Crown. What, then, were the words of the patent? "The Crown thereby gave the patentee, his executors, administrators, and assigns, special license, full power, sole privilege, and authority, that he, the said patentee, his executors, administrators, and assigns, and every one of them, by himself and themselves, or by his and their deputy or deputies, servants, agents, or such others as he the said patentee, his executors, administrators, or assigns, should at any time agree with, and no others, from time to time, and at all times thereafter during the term of years therein expressed, should and lawfully might make, use, exercise, and vend his said invention within that part of the United Kingdom of Great Britain and Ireland called England, the dominion of Wales, and town of Berwick-upon-Tweed, in such manner as to him, the said patentee, his executors, administrators, and assigns, or any of them, should in his or their discretion seem meet." Now, foreigners, as well as British subjects, were liable to actions for injuries to the civil rights of British subjects; and there was no reason why they should not be equally liable to action for the infringement of the right thus granted. If that were so, there was equally no reason why the jurisdiction of this Court, should not be appealed to against them. The right would, in former times, have been enforced, in aid of the King's grant, by proceedings in the Star Chamber. In the course of the argument he had inquired whether, if a locomotive engine on a railway, the subject of a patent in England, but for which no patent had been obtained in Scotland, were made in the latter country, it could be allowed to run into England without any objection on the ground of the infringement of the English patent; or, if the invention had been the subject of a patent in England, but not in Ireland, the vessel would be permitted to trade between Dublin and Liverpool without any such objection. The answer given to this was, that the prior use of a patent in Scotland would be fatal to a patent obtained in England, but that such would not be the case if the prior use were in a foreign country. This was not, however, an answer to the observation. In one case the result would depend on the previous knowledge of the invention—in the other case, on the effect of the patent. The remarks of Lord Eldon, in the case of the Bibles—"Richardson vs. the University of Oxford"—had been referred to on the cases of necessity which arise for allowing a user of the subject of a patent, and it was said that this was such a user as the Court would not restrain. There might, no doubt, be such cases of necessity, and perhaps the case suggested of a foreign ship stranded on the English coast might be such a case. It must be remembered that foreigners were at liberty to apply for and obtain patents in this country with the same privileges as British subjects. If foreign inventors did not take this step, they, to that extent at least, withheld the use of their invention from the subjects of this country; and, if they were restrained from using their own inventions in this country, such inventions being the subjects of patents granted to other persons, they had nothing taken from them by that restraint, for, if the patent were valid, the right of using their inventions in this country was one which they had never enjoyed. It had been argued that any interposition of this Court might be met by similar restraints on our ships abroad; but this question resolved itself into one of national policy. It was a proper subject for the consideration of the Legislature; but it was the duty of this Court to administer the law, and not to make it. He was of opinion that the facts stated did not afford a sufficient ground for refusing the injunction."

The injunction was granted restraining the said company, from using the propeller in Great Britain and Ireland, until licensed by Lowe, the patentee. We have published all the charge, because it is perhaps the most important case of international patent law that has ever been presented. It will afford some study for our patent lawyers, and to many of them, it will be new light. It demands the attention of all our citizens, not merely patentees. The first Mr. Collins, or some other of our steamship owners, knows, will perhaps be an injunction laid upon some of his steamships, for some little bit of an improvement for which some has secured a patent in England some years ago, and about which he knows nothing. It may also be the case with some English ship coming here. It is hard to tell what will come out of this decision.

This question is about becoming national between the United States and England; a review of this decision, with other important matter relating to it, will be presented next week.

Commercial Statistics of England.

A recent work by Mr. Braithwaite Poole, shows that the railways of Britain have cost £240,000,000, the canals £260,000,000, and the docks £30,000,000. The mercantile marine consists of 35,000 vessels, 4,200,000 tons, with 240,000 men; and one vessel is lost on an average every tide! The navy consists of 585 vessels, 570,000 tons, and 48,000 men. Yachts 520, and 23,000 tons. The ancient Britons knew only six primitive ores from which metals were produced; whereas the present scientific generations use 50. The aggregate yield of minerals in the country is equivalent in value to about £25,000,000 annually. The agricultural produce of milk, meat, eggs, butter, and cheese, is 3,000,000 tons, and £50,000,000. The ale, wine and spirits, consumed annually exceed 3,300,000 tons and £54,000,000; whilst sugar tea, and coffee scarcely reach 450,000 tons, and £27,000,000. The fisheries net £7,000,000 annually. In manufactures the cotton, woollen, and silk, altogether, amount to 420,000 tons, and £95,000,000. whilst hardware exhibit 350,000 tons, and £20,000,000; in addition to which 1,250 tons of pins and needles are made yearly, worth £1,000,000. Earthenware, 160,000 tons, £,3-500,000; glass, 58,000 tons, £1,680,000.

The Opium Trade.

A correspondent of the National Intelligencer, writing from China, says there are scarcely any foreign manufactures and products consumed in China. The Opium trade, and some importations of raw cotton are the only counterbalancing sources of reimbursement for all the money left there for teas, silks, &c.—There are American and other merchants who speculate in Opium; but as they have to buy it from India their profits are contingent on the luck of the venture. If this Opium trade could be suspended, the money which is now paid for Opium might find a more legitimate distribution in exchange for cheap cottons, and perhaps breadstuffs; and when it is considered that $30,000,000 are paid by the Chinese annually for Opium, the world at large, and the United States in particular, do lose something by the trade.

The Great Forrest Case.

This celebrated divorce case, so well known throughout our country, was terminated in this city last Monday. The verdict of the Jury was in favor of Mrs. Forrest. She gets $3000 alimony per annum.

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TO CORRESPONDENTS.

D. M., of Vt.—We cannot employ our time in writing out descriptions and preparing drawings of inventions of any particular class for the accommodation of any one individual. You are quite too presumptuous, and we fear do not properly appreciate the valne of our time to us. If you will send us a model or description and drawing of your invention, we will examine it, and give you the best advice we can in the matter, but as for looking up all the information concerning similar inventions, and reporting to you in full upon the peculiar properties of each, is quite out of the question.

F. B. H., of Ind.—There are now in use arrangements for setting saw mill logs, as effective as the one represented. You must either furnish us with a model, or sketch and description, in order that we may be able to judge of its novelty.

T. M. C., of Me.—There is nothing in your rotary engine different from what has already been done. We have seen several sketches in the course of our business essentially like yours. Glad to hear from the filing machine. Should like to publish an engraving.

C. A., of Pa.—There is a probable chance for you on the cleaner, therefore you had better send a model. You know what has been done in these inventions.

R. D., of Pa.—The atmosphere does not assist the condensing engine, but the condensing operation reduces the resistance of the atmosphere from 15 to 2 pounds. The vacuum is equal to about 13 pounds. The non-condensing engine has the full resistance of 15 pounds of the atmosphere to contend against.

If you look at the articles on Water Wheels, in our last volume, you will find the rule for calculating the power of your fall of 6 feet.

R. G., of Florida.—Yours about the punching press is very good.

Rev. R. H. Y., of Pa.—The "American Miller," is published by Henry C. Baird, of Philadelphia. We have no copies for sale.

S. J. T., of Ohio.—We pass the bill matter, and proceed to state that we shall need sketches of your invention before we can decide upon them. Machines for the purpose are very numerous.

M. M. L., of La.—The only pumps we can recommend to you, is a good pair of the common cylinder forcing pumps. A negro can take care of them quite well, and when they require packing, you can easily see how to order that to be done. G. B. Farnham, corner of Cliff and Fulton streets, in this city, makes them. You can write to him, as you will no doubt wish to enquire about the quantity and price of Pipe, &c.

J. P. G., of Me.—Morse claims "a Recording Telegraph," and Judge Kane's decision in the Bain case goes to sustain it. The U. S. Superior Court would reverse his decision, no doubt, as it is radically wrong. You can use the hollow coil magnet, but we cannot answer you definitely, as we do not know your plan. The best works on electric engineering are Davis' pamphlet and an article in the American Chemical Dictionary. We will tell you more next week.

E. C., of N. Y.—We have never known of three overshot wheels connected, and working together, as you propose, but we have been written to about the connection of two, their pulleys being united by belting. This was two or three years ago, since which we have heard no more about it. You are aware of a series of wheels being employed, like trap stairs, only each working separate. The question would be on the union of the three wheels as you propose. As we said before, we could not institute a claim which, in our opinion, would be successful with the Patent Office.

Money received on account of Patent Office business for the week ending January 24.

H. N. H., of N. J., $20; C. P. L., of Ga, $20, S. & S., of Ct., $30; W. B. C.: of N. Y., $30; D. H. T., of Vt., $30; H. & R. F., of Pa, $30; H. & B., of N. J., $25; W. W. & Co., of Ct., $50; S. T., of Pa., $25; D. R., of N. Y., $50.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Jan. 24:—

C. S. B., of N. Y.; C. B., of O.; G. W., of Ct.; D. H. T., of Vt.; C. P. L., of Ga.; D. R., of N. Y.

New Arrangement.

Several of our readers have expressed a wish to subscribe for some literary journal in connection with the Scientific American, not feeling able to take both. We have entered into an arrangement with the publishers of the "American Model Courier," of Philadelphia, and the "American Union," of Boston, which will enable us to furnish either of the two, with the Scientific American, for $3 per annum. They are literary journals of the first order, and are widely circulated in all sections of the country.

Persons writing us without signing their names to the communication, are considered as not acting in good faith, or as mistaking the rules which govern all newspaper establishments, and are therefore not attended to. Never send.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2 and 3—none.

Of Volume 4, about 20 Nos.; price 50 cts.

Of Volume 5, all but 4 numbers, price, in sheets, $1, —complete sets, bound, $2,75.

Of Volume 6, all; price in sheets, $2; bound, $2,75

Of Vol. 7, all back numbers at subscription price.

An Important Paragraph.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

ADVERTISEMENTS.

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One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

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American and Foreign Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

MORTISING MACHINE.—Dear Sirs: I received the Portable Mortising Machine about 3 weeks ago; I have used it, and am very well pleased with it. It is the best plan of a machine of the kind I have ever seen. W. R. McFARLAND.

Nashville, Tenn., 1851.

This machine is simple, durable, and effective, and is boxed and shipped for the low sum of $20.

MUNN & CO.

$3,000 REWARD.—TO MECHANICAL INVENTORS AND OTHERS.—In view of the many accidents occurring on Railroads, and with a desire to promote the safety and comfort of railway passengers, the undersigned proposes to offer for competition the following premiums:

$1,500 for the best invention for preventing loss of life from collisions, and from the breakage of axles and wheels.

$800 for the best method of excluding dust from cars when in motion.

$400 for the best railroad brake.

$300 for the best sleeping or night seat for railroad cars.

The premiums will be open for competition from this date until the next annual Fair of the American Institute, where they are expected to be on exhibition; and no invention already introduced to the public will be entitled to compete for the prizes. It must be understood that these inventions are to be such as can be adopted and put into general use, the inventors in all cases retaining their right to patents.

The above will be left to the decision of competent judges, appointed by a Committee of the American Institute, to whom all applications on the subject must be addressed. F. M. RAY.

New York, Jan. 1, 1852 1

TO MACHINISTS.—William B. Parsons, Manufacturer of the "Excelsior" Sand and Emery Paper, has on hand a very superior article of Corundum, suitable for emery purposes. This has been thoroughly tested at the Nashua Lock Works, Nashua, New Hampshire, and proved to be second only to emery, and perfectly free from dust and extra grains of grit. For sale in any quantity, and all numbers, at 187 Water st, N. Y. WILLIAM B. PARSONS.

20 4*

NOTICE—DISSOLUTION.—The firm of BLANCHARD & PARSONS is this day DISSOLVED by mutual consent. The business of the firm will be settled by Wm. B. Parsons.—New York, Jan. 12, 1852.

THOMAS LEGGET, JR.,
E. BLANCHARD,
WM. B. PARSONS.

The manufacture and sale of the Excelsior Sand and Emery Paper will be continued by WM. B. PARSONS, No. 187 Water st., New-York. 20 2*

A **STEAM ENGINE** of 30 horse-power, for sale, with two boilers, furnace front, grate bars, copper pipe, heater, double-acting pump for cold and hot water; also Judson's patent Governor Valve. and Noyes & Allan's Metallic Packing—all complete and ready to be put in operation immediately. For particulars address HENRY BACMEISTER, Steam Engine Builder, Schenectady, N. Y. 19 4*

ONE DOUBLE ENGINE of six-horse power, second-hand, used about one year; the size of cylinders, 4 inch bore and 12 inch stroke, and furnished with pump, regulator, and all attachments; the boiler is horizontal tubular, 7 feet long, 3 1-2 inches in diameter, and requires no brick to set it, the fire being made inside the boiler. The above engine will be sold for $400 cash, delivered in New York.

MUNN & CO.

ENGINE FOR SALE—An Upright Engine 6 1-2 horse-power, 18 inch stroke, inch diameter; pumps, governor, all complete; 8 foot boiler, 3 feet diameter, two flues; cast-iron head, grate bars, &c.—built in 1848, has run 8 month in all, is in good order, and can be warranted shipped in good order for $475. Address, remitting draft, to MUNN & CO.

$10 REWARD—I will pay the above amount to any person who will send by mail or otherwise, to my address, a perfect copy of the Jury Trial, commenced in May, 1846, by Hitchcock (an assignee of the Woodworth Patent) against Brown and others, in Vermont, within one month from this date.

19 3* SAML. B. SCHENCK, 64 Cortland st. N.Y.

VENTILATION.—Mr. Ruttan, of Coburg, Canada, is desirous of an opportunity to direct the erection (for ventilation) of a good dwelling or school house in the city of New York. For particulars inquire at the Scientific American Office. 15 10*

THE WEEKLY SUN.—This large, interesting and excellent neutral Weekly newspaper,—the first dollar-a-year weekly paper ever printed—has now entered upon its sixteenth year of publication. Its contents embrace the very latest news from all parts of the United States and the world, received by Telegraph, from Correspondents and by Steamers; also Shipping Intelligence, Monetary Affairs, Prices, Current, Agriculture, Reports of the various American Cattle markets, summaries of general news, interesting selections of Light Literature, Mechanics. Single subscriptions ONE DOLLAR A-YEAR.

WEEKLY SUN CLUB RATES.

Club of 6 copies . . . $5	Club of 34 copies . . . $25
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Post-pay all letters; write name, Post-office, County, and State, plainly, and direct to

19tf BEACH BROTHERS, New York City.

CLOCKS FOR CHURCHES, PUBLIC BUILDINGS, RAILROAD STATIONS, &c., and REGULATORS FOR JEWELLERS.—The undersigned having succeeded in counteracting effectually the influence of the changes of the temperature upon the pendulum, and introduced other important improvements in the construction of clocks, are prepared to furnish an article, superior in every respect (the highest grade warranted to vary less than two minutes in a year) to any made in the United States. Ample opportunity will be afforded to test their qualities. Glass (illuminated) dials of the most beautiful description furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island, N. Y.

"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."—[Scientific American.

"Mr. Byram is a rare mechanical genius."—[Jour. of Commerce. 19tf.

EUREKA! NEW YORK AHEAD OF the World!—Patent Premium (Silver Medal, 1851, Amer. Insti.) Corn and Cane Stalk, Hay, and Straw Cutter. Berthold's machine is warranted, after a test of 3 years, to surpass any machine of the kind ever offered in the United States,—strong words, but "FACTS are not assertions." It will cut, and leave in better condition, corn or cane stalks (almost any machine will cut hay or straw) and save 40 per cent. of material. It being impossible for the inventor to visit the different sections of the United States, he has concluded to offer State or County Rights to manufacture and sell his patent machines: a profit of 33 per cent. can be readily realized by manufacturing. Sales are unlimited. For information in regard to State or County rights. Address (post-paid) ENGELBRECHT & HOOVER, Attorneys and Agents for the Patentee, 257 Broadway, New York. 19 4*

A. B. WILSON'S SEWING MACHINE, justly allowed to be the cheapest and best now in use, patented November 12, 1850; can be seen on exhibition at 195 and 197 Broadway (formerly the Franklin House, room 23, third floor), New York. Rights for territory or machines can be had by applying to

19 4* WM. S. LOVELL, Agent.

BILLINGS PATENT BAND WRENCH, for Wagons and Carriages.—This article is fully described and illustrated by engravings in No. 7, Vol. 7. of the Scientific American. The Patent Band Wrench applies to wagons and carriages where the common or square nut is used. They are perfectly tight and prevent all dust and dirt from reaching the axle. The wheel is taken off by means of a small pocket key. A Silver Medal was awarded this article by the American Institute at their late Fair in this city. The Bands are manufactured by the Patent Band Wrench Co., located at Claremont, N. H. Smith Van Horn & Co. are the agents for this city. Orders addressed to them, as above, will meet with prompt attention. A. M. BILLINGS,

12tf General Agent for the Co.

THE EXCELSIOR Sand and Emery Papers. are offered as new and superior articles, being manufactured by an improved process; the paper is made from the best Manilla hemp, and consequently is very strong and lasting; the grit is of the sharpest and most enduring kind, and is firmly attached to the paper with a remarkable evenness of surface; their freeness from ridges, stripes, and other imperfections, recommend them to the notice of consumers. These papers have been used by many of our first mechanics, and are pronounced superior to all others. Every sheet is stamped WM. B. PARSONS, and warranted. Samples furnished at the office, No. 187 Water street, New York. WM. B. PARSONS,

14 6m* Sole Proprietor.

P. W. GATES'S PATENT DIES FOR CUTTING SCREWS—Patented May 8th, 1847.—This Die cuts Screws of any size, V or square thread, by once passing over the Iron. Also, Lead Screws for Lathes, Hoisting Screws, &c. All orders for Dies and Taps, with or without machines, will meet with prompt attention by addressing P. W. Gates, or Gates & McKnight, Chicago; Marshall, Bement & Colby, Philadelphia; Woodburn, Light & Co., Worcester, Mass. References—All the principal machine shops in New York, Philadelphia, and Boston. 13 6m*

ADIRONDAC American Cast Steel.—This steel has recently been greatly improved in uniformity, soundness, strength, and toughness. It is purely American, and will be sold as low as the imported; this improved quality is warranted superior to any other in market. Friends of home industry are requested to try this new and uniform steel.

QUINCY &. DELAPIERRE,

15 6* Warehouse 81 John st., N. Y

LATHES FOR BROOM HANDLES, Etc.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post.paid) MUNN & CO.

At this Office.

FOR SALE—An Iron Foundry, with Patterns, Flasks, &c.; also engine and other lather, upright and horizontal drills, machinery, tools, &c. The foundry building is 63 by 34 ft., with a projection for cupola, and is well fitted for doing a large amount of business. There is also connected with the same a Blacksmith and Pattern Shop. Water power is used, and a large amount can be had at a reasonable rent. Persons wishing to engage in this profitable branch of business, will find it for their interest to call and examine the premises. Terms of payment made satisfactory. For particulars inquire of SAML. DEMING.

Farmington, Ct., 1851. 18 4*

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., have on hand six 12 ft. slide lathes, 28 in. swing; also four 8 ft. do.; 21 in. swing, with back and screw gearing, with all the fixtures; one 5 ft. power planer; 12 drill presses, 4 bolt cutting machines, 30 small slide rests; 5 back geared hand lathes, 21 in. swing; 15 do. not geared; 8 do. 17 in. swing on shears 5 1-2 feet; 25 ditto with and without shears, 13 in. swing; counter shafts, all hung if wanted suitable to the lathes. Scroll chucks on hand; also index plates for gear cutting. Cuts of the above can be had by addressing as above, post-paid. 9tf

BEARDSLEE'S PATENT PLANING MAchine, for Planing, Tonguing and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine shop and Foundry of Messrs. F. & T. Townsend, Albany N. Y.; where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the abovenamed foundry—or at his residence No. 764 Broadway; Albany. GEO. W. BEARDSLEE. 5tf

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions. Orders respectfully solicited and punctually attended to. Washington Factory, Newark, N. J. 7 20*

PAINTS, &c. &c.—American Atomic Drier, Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.

QUARTERMAN & SON, 114 John st.,

9tf Painters and Chemists.

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Mortising and Tennoning machines; Belting; machinery Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 13 tf

WOODWORTH'S PLANING MACHINE—For sale, the right to use this justly celebrated labor-saving machine in the following States, viz., Pennsylvania west of the Allegheny Mountains, Virginia west of the Blue Ridge, Ohio, Indiana, Kentucky, Tennessee, Wisconsin, Iowa, Missouri, Arkansas, Texas, Louisiana, Florida, Alabama, and Mississippi. For particulars apply to the Proprietor, ELISHA BLOOMER, 208 Broadway. 17 12*

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th 1850, is without doubt the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber and so great was the favor with which this machine was held at the last Fair of the American Institute that an unbought premium was awarded to it in preference to any other on exhibition. Persons wishing for rights can address (post-paid) JAMES D. JOHNSON, New Haven, Ct.; or WM. WOOD, Westport; Ct., All letters will be promptly attended to. 37tf

LEONARD'S MACHINERY DEPOT, 109 Pearl-st. 60 Beaver N. Y.—The subscriber is constantly receiving and offers for sale a great variety of articles connected with the mechanical and manufacturing interest, viz.: Machinists' Tools—engines and hand lathes; iron planing and vertical drilling machines; cutting engines, slotting machines; bolt cutters; slide rests; universal chucks &c. Carpenters' Tools—mortising and tennoning machines; wood planing machines &c. Steam Engines and Boilers from 5 to 100 horse power. Mill Gearing—wrought iron shafting; brass and iron castings made to order. Cotton and Woolen machinery furnished from the best makers. Cotton Gins; hand and power presses. Leather Banding of all widths made in a superior manner; manufacturers' Findings of every description. P. A. LEONARD. 10tf

MANUFACTURE OF PATENT WIRE Ropes and Cables—for inclined planes, suspension bridges, standing rigging, mines cranes, derick, tillers &c.; by JOHN A. ROEBLING; Civil Engineer—Trentou N. J. 47 1y*

RAILROAD CAR MANUFACTORY—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty, and good taste, as well as strength and durability, we are determined our work shall not be surpassed. JOHN R. TRACY,

14tf. THOMAS J. FALES.

McCORMICK'S PATENT REAPERS AND MOWERS.—1700 of these machines, for which the great Medal of the World's Fair was awarded, are being manufactured at Chicago, Ill, with the intention of supplying the South-eastern States for the next harvest The gold medal of the Chicago Institute was recently awarded for this Reaper and Mower, tested against two other mowers, in cutting prairie grass; and the first premium of the State Agricultural Societies of Wisconsin, Michigan and Pennsylvania, were also awarded at their late Fairs. Price $120 at Chicago, and $122 delivered at Philadelphia; terms otherwise accommodating. 9tf

PATENT CAR AXLE LATHE—I am now manufacturing, and have for sale, the above lathes; weight, 5,500 pounds, price $600. I will furnish a man with each lathe, who will turn and finish axles for 50 cents each, if desired. I have also for sale my patent engine screw lathe, for turning and chucking tapers, cutting screws and all kinds of common job work, weight 1500 lbs., price $225. The above lathe warranted to give good satisfaction. J. D. WHITE, Hartford, Ct. 7 6m*

LOGAN VAIL & CO., No. 9 Gold street, New York, agents for George Vail & Co., Speedwell Iron Works, have constantly on hand Saw Mill and Grist Mill Irons, Press Screws, Bogardus' Horse-Powers, and will take orders of Machinery of any kind, of iron and brass; Portable Saw-mills and Steam Engines, Saw Gummers of approved and cheap kind, &c. Gearing, Shafting, large and small, cast or of wrought iron. 11tf

HAWKIN'S Stave Dressing Machine—Is now in operation in the city of Milwaukie, Wis., and will dress from 6 to 8000 staves per day, ready for the truss hoops, and at one operation. Rights for States and Counties, and also machines, for sale, apply to WM. HAWKINS, Patentee, Milwaukie, Wis. 15 20*

A. B. ELY, Counsellor at Law, 46 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 13tf

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SCIENTIFIC MUSEUM.

Traction.

Traction, in mechanics, is the act of drawing a body along a plane, usually by the power of men, animals, or steam; as when a vessel is towed upon the surface of the water, or a carriage moved upon the road. The power exerted in order to produce this effect is called the force of traction. Numerous experiments have been made for the purpose of ascertaining the value of a force so exerted; and when men are employed to draw laden boats on canals, it is found that if the work be continued for several days, successively, of eight hours each, the force of traction is equivalent to a weight of 31 1-9 lbs. moved at the rate of two feet per second, or 1 1-3 mile per hour, (it being understood that such weight is imagined to be raised vertically by means of a rope passing over a pulley, and drawn in a horizontal direction). The force of traction exerted when, without moving from his place, a man pulls horizontally against a weight so suspended, is estimated at 70 lbs. The action of a horse in drawing a vessel on a canal is said to be equivalent to a weight of 180 lbs. raised vertically, as above supposed, with a velocity of 3 1-3 feet per second, or 2¼ miles per hour; but this estimate has been considered too high; and from experiments which have been made on the power of horses in wagons, carts, and coaches, on level ground, it is found that the force of traction exerted by a stout horse is equivalent to 80 lbs. raised at the rate of 4 2-5 feet per second, or 3 miles per hour. Tredgold considers that a horse exerts a force of traction expressed by 125 lbs. raised at the rate of 3 2-3 feet per second, or 2½ miles per hour. A man or a horse can, however, double his power of traction for a few minutes without being injured by the exertion; and when the carriage is in motion, so that the friction on the ground is alone to be overcome, a horse can draw during a short time, on a level road, a weight exceeding 1,500 lbs.

The force of traction is found to vary nearly with the term $(w-v)^2$, where w is the greatest walking velocity of a man or horse when unresisted, (6 feet per second, or 4 miles per hour, for a horse), and v is the velocity with which the vessel or carriage is moved. From theoretical considerations it has been determined that the greatest effect is produced when the velocity of the object moved is one-third of that with which the man or animal can walk when unresisted.

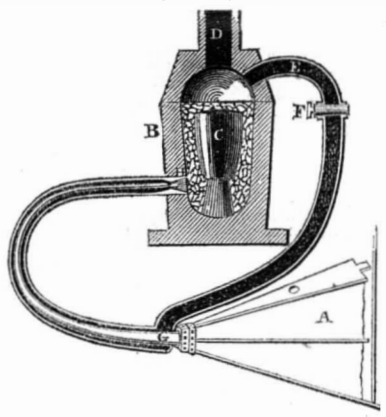
If a wheel-carriage were situated on a level plane, which opposed no resistance, it is evident that, whatever were the diameter of the wheels, the smallest conceivable power of traction applied to the axle would suffice to put the carriage in motion. But when a wheel in moving meets with an obstacle on the ground, that obstacle is pressed at the point of contact by a force acting in the direction of a line drawn to it from the centre of the wheel, and arising from that part of the weight which is supported by the wheel, together with the force of traction; therefore, by the 'resolution of forces,' the ratio between the resistance which is to be overcome by the moving power and the weight on the wheel will become less as the diameter of the wheel is increased; also the most advantageous direction in which the force of traction can be exerted is perpendicular to the line of pressure drawn from the centre of the wheel to the obstacle. But the height of the wheels cannot exceed certain limits, depending on the use to which the carriage is applied; and when the latter has four wheels, the height of those which are in front must be such as will allow it to be turned round within a given space; also, when a horse is employed to move a carriage, attention must be paid to the conditions under which the power may be advantageously exerted.

It was first observed by M. Deparcieux, and published in the 'Memoires de l'Academie des Sciences,' 1760, that horses draw heavy loads rather by their weight than by their muscular force. Sir David Brewster has also remarked that when the resistance is great, a horse lifts both his fore-feet from the ground; then, using his hinder-feet as a fulcrum, he allows his body to descend by its weight, and thus overcomes the obstacle; and, it may be added, that when this action takes place with a two-wheeled carriage, if the loading is disposed so that some portion may press on the horse's back, the effect of the animal's weight will thereby be increased. Now, if the traces, or the shafts of the carriage, were attached to the horse's collar, near his centre of gravity, a line imagined to be drawn from the latter point to his hinder-feet may represent his weight, and a line drawn perpendicularly from his feet upon a plane passing through the traces of shafts may represent the lever of resistance; but while the former line remains the same, this lever becomes less at the plane of traction (that of the traces or shafts) inclines more upwards from the wheel; and therefore, in order that the power of the horse may be advantageously applied, the diameter of the wheel should be as small as is consistent with other circumstances.

Experiments have shown that when the angle of traction, as it is called, that is, the angle which the plane of the traces makes with the road on which the carriage is moving, is 15 or 16 degrees, a horse pulls with good effect, and the height of the points at which the traces are attached to a horse's collar being about 4 feet 6 inches from the ground, it follows that, in order to obtain this inclination, the lower extremities of the traces or shafts should be 2 feet 3 inches from the ground. In general, however, in two-wheeled carriages the height of these extremities is about 3 feet. As an example of the force of traction exerted by steam, it may be stated that on a level line of railway, an engine with an 11-inch cylinder, and having an effective pressure of 50 lbs. per square inch in the boiler, drew 50 tons at the rate of 30 miles per hour, working 10 hours daily; and that the same engine, with an equal pressure in the boiler, drew 160 tons at the rate of 15½ miles per hour.

On Boilers.---No. 10.

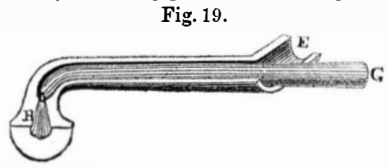
Fig. 18.



Cook's Smoke-Consuming Tuyere.—A number of American inventions have been patented. Mr. Dimpfel is the patentee of a Smoke Blower, which is well known, and Mr. Ransom Cook, of Saratoga, N. Y., is the patentee of the Smoke Tuyere, illustrated by the accompanying engravings, figures 18 and 19.

We present this Tuyere because we believe it is applicable to blacksmiths' forges, and any furnace where a bellows and blower is used. We have exhibited the tuyere as employed in connection with a cupelling furnace, but it is equally applicable to any other. A is a common bellows; B is the furnace; C is a crucible placed in the furnace, and seated on a block; it is surrounded with fuel. D is the chimney; E is a pipe or tube leading from

Fig. 19.



the chimney, and connected with the air-pipe, G, which enters the bottom of the furnace to supply the fuel with air. F is a cock to close the passage between the chimney and the supply pipe, to supply a greater or less opening according to circumstances. It will be observed that the pipe, G, which leads from the bellows to the furnace, is an interior tube; it is placed inside of an outer tube, as shown in fig. 19. There is a small space left between the two tubes, so that smoke from the chimney will pass round and between the two tubes. The air that is forced in by the bellows or blower, is therefore condensed; and when it escapes out at the end H, wheer the space is enlarged, it expands, and thus a partial vacuum is created at the entrance to the furnace or fire. This partial vacuum draws—to use a familiar term—some smoke out of the chimney, according to the well known laws of gravitation. This smoke is returned to the furnace, mixed with fresh air, to render it combustible, and it is ignited by passing through the red-hot coals. Working machinery (and a blower in the chimney is one of these) has been employed to force the smoke back through the fire, but this invention takes advantage of a law of nature, and does away with the necessity of working machinery to return the smoke. It also provides, in a most simple manner, for that which is necessary to render the smoke combustible, viz., the mixing of it with a quantity of fresh air. When a fire is first mended, a great quantity of black smoke generally escapes; this smoke is fine carbon or coal in mechanical suspension. At that period, above all others, a smoke-returning apparatus is most necessary, for after the coal is well ignited, no black smoke escapes—the carbon is fully ignited, and there is but little necessity then for the action of a smoke-consuming device or machine. A machine working when there is no necessity for its action, is a dead loss, and is expensive. No clear description of the principle and application of this Smoke-Consuming Tuyere has ever before appeared in public prints. We have seen notices of it, but they were neither clear nor intelligible to general readers. The accompanying engravings and description will enable any person to understand the invention.

Singular Effects of Disease of the Brain.

A citizen of Livingston County died a few days since, of inflammation of the brain. During his last sickness his aberration of mind assumed the very singular phase of forgetfulness of substantive ideas. In his conversation he could employ all the parts of speech but "nouns," and though he was inclined to say much, he could not express himself fluently except in the use of words of the class named. These ideas he was obliged to omit, or express only by implication. An examination of his brain was made after death, when the following facts were elicited:—From the *dura mater*, or outer lining of the brain, an adventitious bone had grown, which penetrated the brain and caused suppuration of the anterior and lower part of one of the lobes of the brain on the right side This was the only indication of disease or loss. The foreign bone had no union with the skull. The fact is very singular, and the case is novel. Aberration of the mind is attended with the loss or forgetfulness of some class of ideas, but this case is anomalous from the fact that it was attended only by a forgetfulness of one class of words, for the person under consideration seemed to possess the idea denoted by the word, while the word itself was beyond his reach.—[Roch. Amer.

[The above is certainly a singular case. We can have no idea of any person having an idea that is not substantive. The idea of an act without an actor is certainly a singular thing.

The Coal Trade of Pennsylvania.

The amount of bituminous coal mined in Pennsylvania during the year 1851 was nearly 1,400,000 tons, and of anthracite nearly 4,900,000, making an aggregate of 6,300,000 tons. The value is about $22,000,000. Tne coal-fields of Pennsylvania cover one-third of the State, or about 15,000 square miles, lying above or within the water-level. Those of England, Scotland, Wales, and Ireland combined, contain only 11,000 square miles of coal, in an area of 120,000 square miles of territory.—This coal in many cases lies from 900 to 1,800 feet below the surface of the ground, and is raised by machinery. In regard to the quantity of iron-ore, nearly the same relative proportion exists between Great Britain and Pennsylvania.—[Philadelphia Ledger.

Vegetable Parasites in Sugar.

M. Tayen has observed in sugar, at Paris, a parasistic vegetation which runs in cavities in lines, and changes the sugar to a reddish tint. The sporules of this cryptogamic vegetation were not over one or two thousandth of a millimeter in length. During the past year he detected in a sugar refinery at Paris, a variety of this vegetation without a reddish tint, occupying irregularly scattered cavities; its sporules are a little larger than in the reddish kind. The sides of the cavities are covered by a thin membrane, from which the filaments proceed. He has nrmed this vegetation Glycyphila, from two Greek words signifying sweet and lover.

Singular Cause of Death.

Mr. Francis Choate, of Lynn, aged 48 years, died at the Massachusetts Hospital a few days since of mortification of the bones of the jaw. The business of the deceased was the manufacture of friction matches, and it is supposed that the poisonous exhalation thus imbibed was the cause of the disease which resulted in his death.

[We have seen the above in a number of our exchanges. It is not a singular case; the disease is well known, and peculiar to all those engaged in making phosphorated matches. The phosphorus used is the cause of it. A remedy for the evil has been discovered, as those who are subscribers to the Scientific American have been informed some time since. The discovery is the making of phosphorous amorphous.

LITERARY NOTICES.

The Magazines for February have been sent us by Messrs. Dewitt & Davenport, Tribune Buildings.—They are all beautiful numbers, and deserve the patronage of the American public in preference to Harpers' and others, made up of the borrowed literature of Europe, without encouragement to American authors. In point of real merit, they are much superior. Graham's has several splendid steel and wood engravings, besides 112 pages of clearly printed text.

Sartain gives his readers a fine picture of Columbus and his companions attending religious service in the new world, a beautiful picture of the Capitol enlarged, besides several done on wood. It is edited with marked interest.

Peterson's Ladies' National, edited by Ann S. Stephens, is an old favorite, and deserves well. The illustrations are numerous, and the contributions are from the highest intellectual sources. The two former are $3 per annum, the latter $2.

Practical Model Calculator.—No. 6 of this work, edited by Oliver Byrne, and published by Henry Carey Baird, of Philadelphia, contains rules for calculating the dimensions of the various parts of steam engines, and their power; also, rules for calculating the strength of materials. This is a very useful work. We hope Mr. Byrne will in some number present a clear account of the coefficients employed. This will be very satisfactory to the great body of our mechanics. For sale by Dewitt & Davenport, of this city.

Dexter & Brother, 43 Ann street, this city, have just received from London a large edition of Kossuth in England, beautifully illustrated, containing a memoir, and all his speeches. It is worth possessing, and is sold for 25 cents at the office as above.

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